TELEPHONY

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THE JOURNAL OF THE TELEPHONE INDUSTRY

SPRING CONSTRUCTION—RURAL ISSUE

XUM

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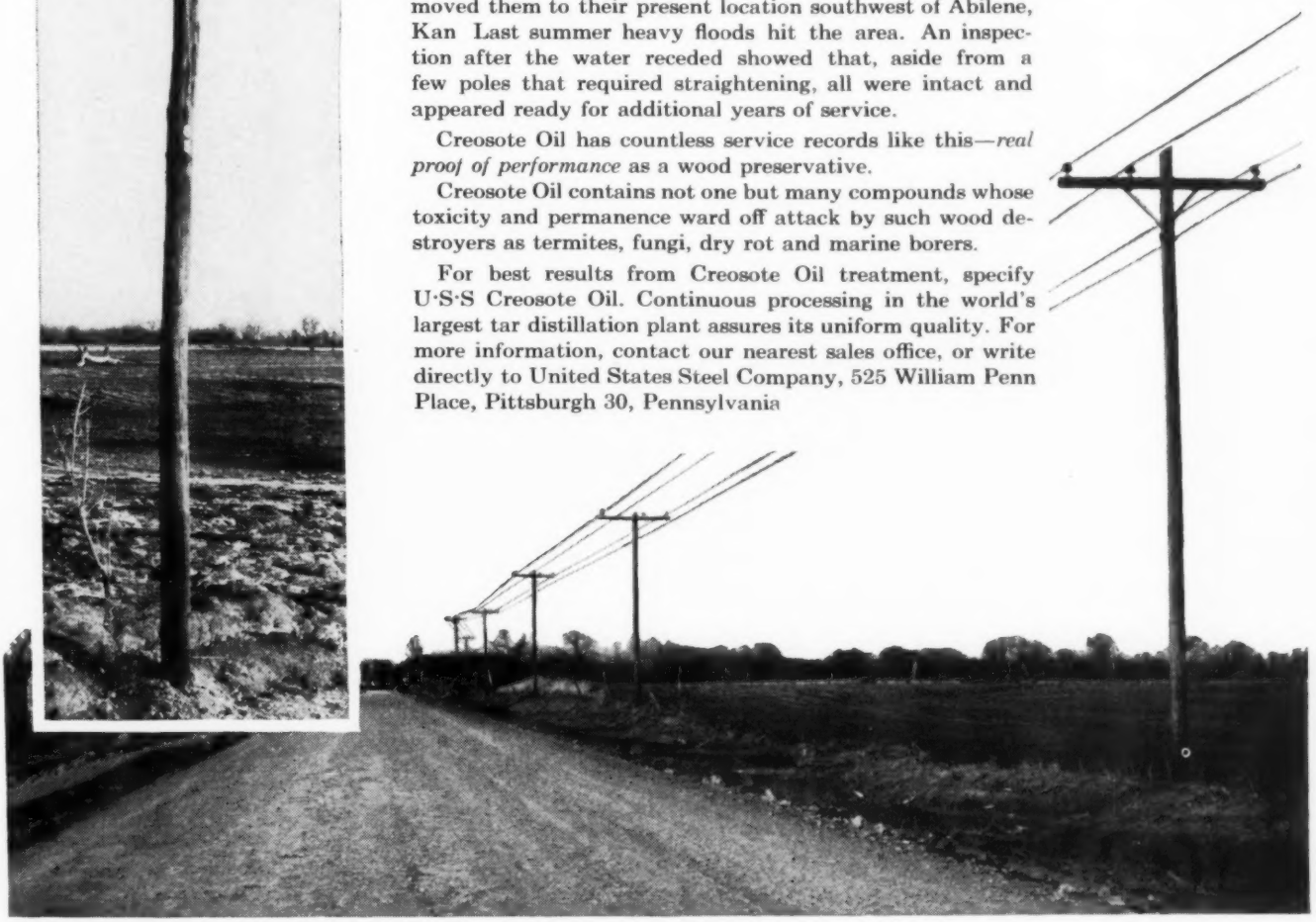

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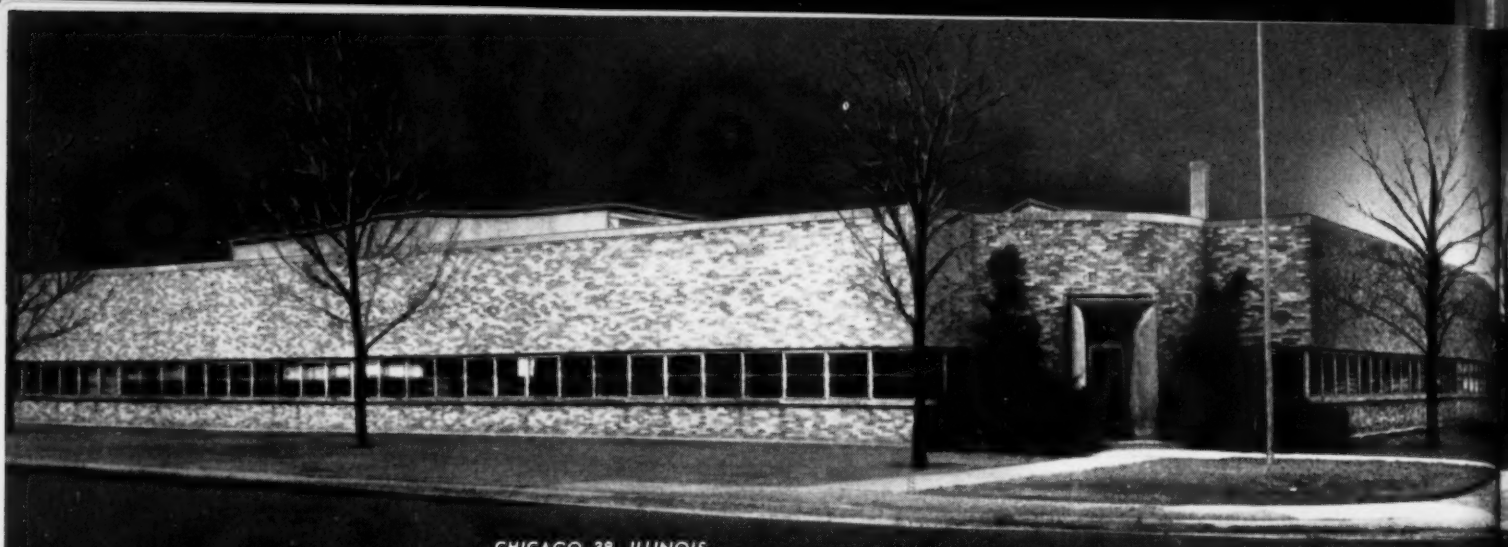

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XUM

FLASHES AND PLUGS

MONKEY BUSINESS IN BOOM. An unsuspected demand for pocket-picking monkeys apparently exists in St. Louis, Mo., the Humane Society of Missouri reported recently as their switchboard was flooded with more than 250 calls for an "orphan" monkey early one afternoon.

Sgt. Lee J. Potter, harried but victorious, brought in the mischievous monkey, a pocket-rifling female named Cheetah, after the former owners decided it wasn't a suitable pet for their little boy. He announced he would give the monkey away, and the telephone calls started.

"People plead like they were trying to adopt a baby," said a Humane Society employe helping out on the switchboard. "Some of them started by saying, 'I have a lovely seven-room house.' "

A somewhat amazed Sgt. Potter repeated the warning of Cheetah's former landlords, Mr. and Mrs. William F. Guffey Jr. The monkey dislikes small children; takes a dim view of women, but gets along fine with men who don't mind having their pockets picked. Applicants are being instructed to write, not call, the society.

"I want the monkey to go to a bachelor," said Sgt. Potter, "a bachelor with roomy pockets and steady nerves."

• • •

LEFT OVER. It was a long, cold day for everyone at the ball park on Apr. 16 when Cincinnati and Chicago opened the season, but it was much longer for James McElhaney, a fan.

McElhaney went to the rest room when the score was tied at 5 all. He was still there when the Cubs edged out a victory in 10 innings. He was still there when everyone else had gone home—even the groundkeepers. Midnight was not far away.

McElhaney told police he had fallen asleep. When he awakened, the park was locked. He reached a paystation and called the hotel where he was to have met the friends with whom he attended the game.

They told him to call the police, who brought a stepladder. McElhaney left the park by climbing it and going over the left field wall.

• • •

'BUT, HONEY!' A Seattle, Wash., woman, who wishes to remain anonymous, reported to the Seattle *Times* that she recently was besieged by a series of "wrong-number" telephone calls.

She soon took care of them in short order, however, especially the drunken man who called and mumbled: "Please, Honey, I'm so sorry. Can I come home now?"

The woman couldn't stop his pleas, so she finally said:

"All right. Let's forget everything. Come on home."

"I'll bet there was an interesting scene in that house," said the woman.

• • •

DARN THAT PHONE! On a rural party line, a subscriber formed the habit of taking down the receiver for hours at a time without doing any talking, thereby weakening the talking current and giving other subscribers the idea that someone was always listening in.

All the complainers told about hearing a clock ticking near the open telephone. With this as a clue, the telephone manager investigated, and found that an elderly lady had been using the receiver as a darning egg.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

April 26, 1952

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Gas Tanks
Generator Cable
Glass Insulators
Gloves
Grips
Guard Rails
Guards
Gun Solder
Guy Clamps & Accessories

Habidure Wire
Habirshaw Wire
Hack Saws, Blades
Hammer Drills
Hammers
Handles
Hangers
Hardwood Dressers
Hatchets
Haven's Grips
Hoists
Holders
Hole Diggers
Holsters
Hook Type Strain Plates
Hooks
Howes Wire Tools
Hub Guards
Hubeyes

Identification Tags
Inside Wiring Nails
Insulated Tools
Inter-Comm Cable
Interior Junction Box & Accessories
Irons

Jacks
Jenny Supports
Joint Tools
Journals
Junction Box

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Knobs & Accessories
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But in our 6 strategically everything you'll ever

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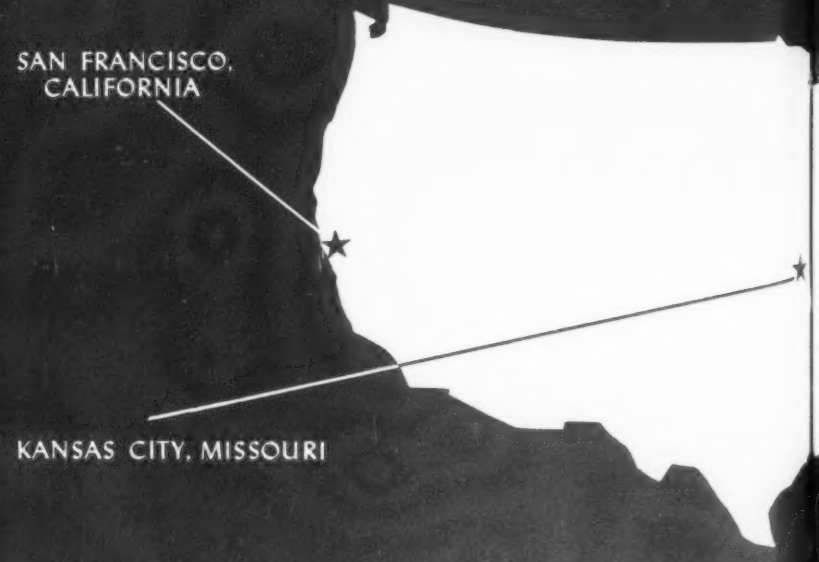
Not even the most experienced construction or maintenance superintendent can predict accurately what is going to be his next need in materials or supplies. That's why it's good to maintain contact with a dependable, quality distributor — to keep abreast of current developments and to be confident of satisfactory service when an emergency occurs.



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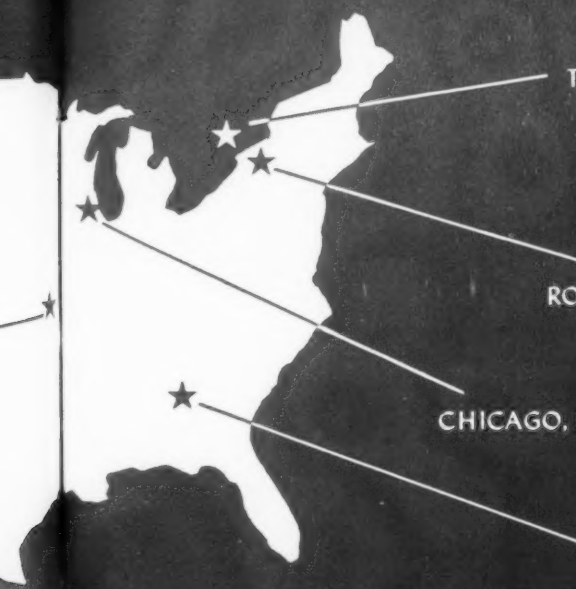

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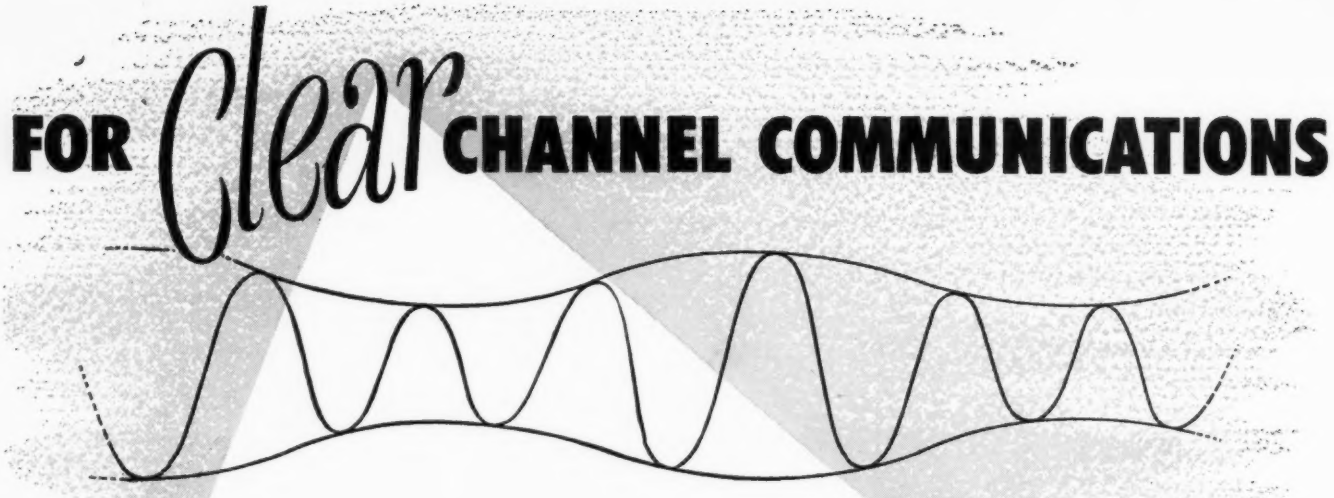
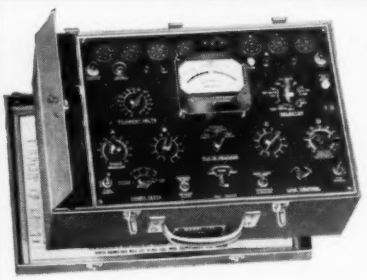


WESTON Model 779 Type 5 ANALYZER

Telephone, carrier current and transmission line measurements are simplified with this compact Weston analyzer, which provides all normal a-c and d-c voltage, current and resistance ranges. Designed in cooperation with telephone and railway signal engineers, it gives readings to -20 dbm at carrier current frequencies and provides for both line bridging and line terminating. Temperature compensated, ungrounded, self-powered. For full details contact your Weston Representative, or write Weston Electrical Instrument Corporation, 617 Frelinghuysen Avenue, Newark 5, New Jersey . . . manufacturers of Weston and Tagliabue instruments.

Related Weston Instruments to Check Circuit Components

Model 697 Volt-Ohm Milliammeter combines a-c and d-c voltage, direct current, and resistance ranges. Self-contained battery. Sensitivity 1,000 ohms per volt.



Model 798 Proportional Mutual Conductance Tubechecker makes quick, accurate tests of receiving tubes, voltage regulator tubes, low power Thyratrons. Ranges 3,000/6,000/12,000 micromhos. Patented circuit uses differential frequency system.

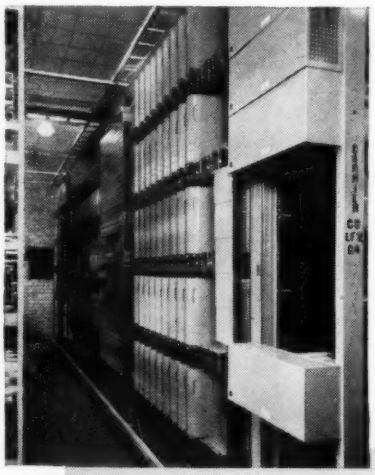
Model 564 Volt-Ohmmeter provides a broad selection of resistance and d-c voltage ranges. Self-contained battery. Sensitivity 1,000 ohms per volt.

WESTON *Instruments*

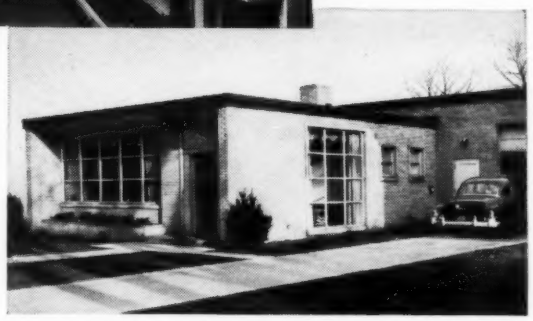
GIRARD, Pennsylvania

cuts over *Federal* STEP-BY-STEP Dial Switching Equipment

President Lewis F. Shepherd, Pennsylvania Telephone Corporation, putting through first call at Girard cutover. In the photo—left-to-right: Albert A. Dunbar, Erie Business Office Supervisor and Theodore J. Schuler, General Plant Superintendent, Pennsylvania Telephone Corporation; E. J. Hart, Federal Telephone and Radio Corporation; Lewis F. Shepherd; Frank D. Reese, Acting Chief Engineer; Frank D. McCarthy, General Commercial Superintendent, and Donald S. Parsons, Erie District Plant Superintendent, Pennsylvania Telephone Corporation.



Partial view of Federal carrier, connector and line-finder bays installed at Girard exchange.



Compact, modern building is attractive center of Girard's new telephone service.

Another PENNSYLVANIA TELEPHONE CORPORATION exchange converts to Federal Step-by-Step with 750 lines and 1600 terminals supplying modern unattended, completely automatic telephone service.

AT MIDNIGHT on March 29 another of its growing list of Federal Step-by-Step dial exchange cutovers was successfully completed by Pennsylvania Telephone Corporation. 750 lines and 1600 terminals were placed in unattended, automatic dial service at the Girard, Pa., exchange, a satellite of Erie, Pa. The new Federal installation provides free service to another Federal Step-by-Step exchange at Fairview, and toll trunks to Erie as well as to other independent telephone companies at Albion and West Springfield. The installation includes a one-position local and toll test board.

The cutover at Girard to Federal equipment marks another important improvement in one of the nation's finest and most modern independent telephone networks.

Federal offers attractive delivery dates on its complete line of telephone switching equipment for any size exchange—equipment backed by 69 years' experience in telephone development. For details, write to Telephone Sales Department.

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Federal Telephone and Radio Corporation

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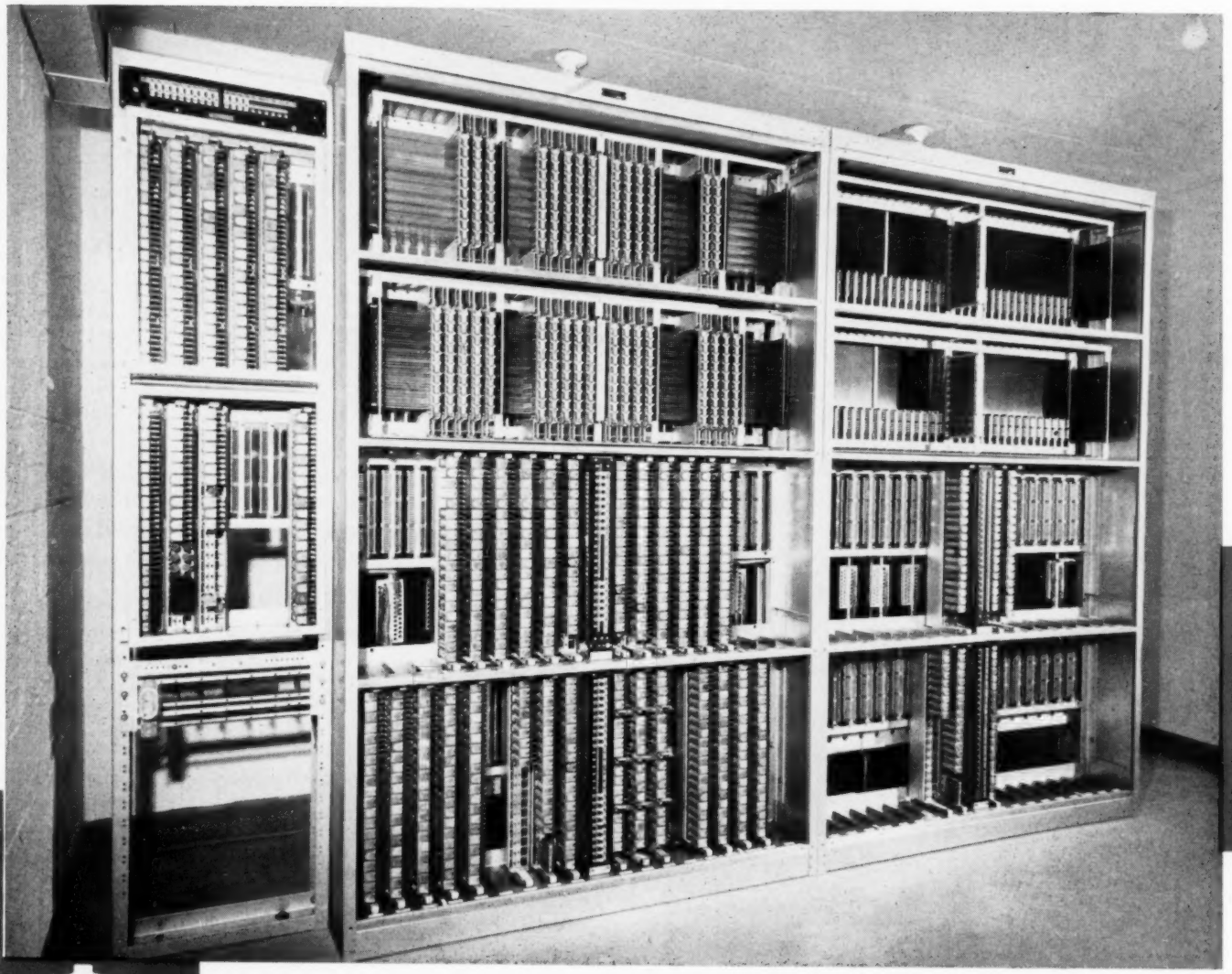

Leich selector dial system at the Le Claire Exchange of the Le Claire-Princeton Telephone Exchanges, Russell J. Enyeart, owner.

$

with a LEICH DIAL

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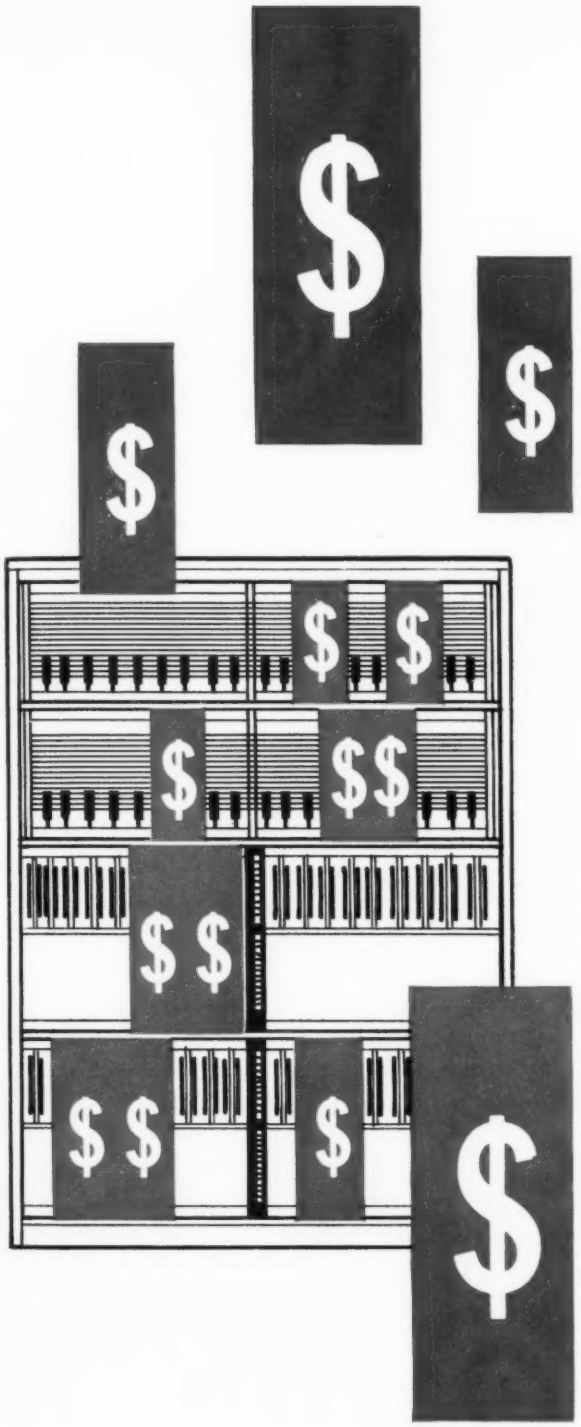

Simplified All-Relay Operation

Leich's all-relay dial system assures you of reliable operation with a minimum of maintenance. There are no elaborate mechanical switching mechanisms to wear or require maintenance or adjustment. The unique design utilizes dependable relays to their fullest extent, provides a switchboard that is comparatively easy to understand and operate.

Jack-in Equipment

The Leich Dial System was the first all-relay switchboard to offer the jack-in flexibility previously available only in switch systems. All the equipment, lines, links, selectors, is jacked-in onto steel frame bays, which have a capacity of 100 lines each. There is no complicated wiring to be done on the switchboard, very little possibility of wrong or poorly soldered connections to cause trouble.

Inexpensive Expansion

You have no worries about additional subscribers necessitating expensive additions when you have a Leich Dial System. Ten lines can be added in seconds by your own switchboard man who simply jacks in a 10-line relay bar on the switchboard. Line finder switches, connector switches and selector switches are also jacked in. No expense for factory installers, no wiring, no soldering. Additional 100 line bays may be added and they also have the same economical jack-in feature.

Simplified Maintenance

The maintenance man's job was carefully considered in the designing of the Leich Dial System. Plexiglass doors make the operation plainly visible, there is no back to back arrangement of equipment, all the wiring is accessible without taking the board out of service. Parts in trouble may be replaced by jacking-in spare parts and repairing or having the parts repaired when there is time.

Greater Traffic Capacity

Leich Dial Systems accommodate 15 links per 100 lines. This is considerably more than most dial switchboards, is ample for practically all traffic conditions. The Leich selection scheme assures maximum use of all equipment. Trunk groups are not limited to 10 outlets per group.

Quick Installation

Installation costs have been brought down to earth. A Leich Dial System can be installed at the rate of 80 man hours per 100 lines. When it is necessary to erect a building, the Leich Dial System will prove economical because it requires less floor space than other boards of similar capacity. If you're considering a dial conversion be sure and obtain information on the Leich Dial System. There's no charge, no obligation. Write Leich Sales Corporation, 427 W. Randolph, Chicago 6, Illinois.

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Make better NET with

Make them ALL Automatic ALL-RELAY NOW!

NORTH CX-100 All-Relay Automatic boards start serving small communities with a few lines, expand readily as your needs expand.

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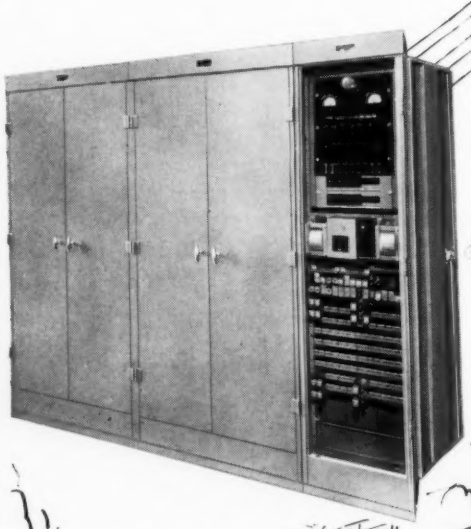
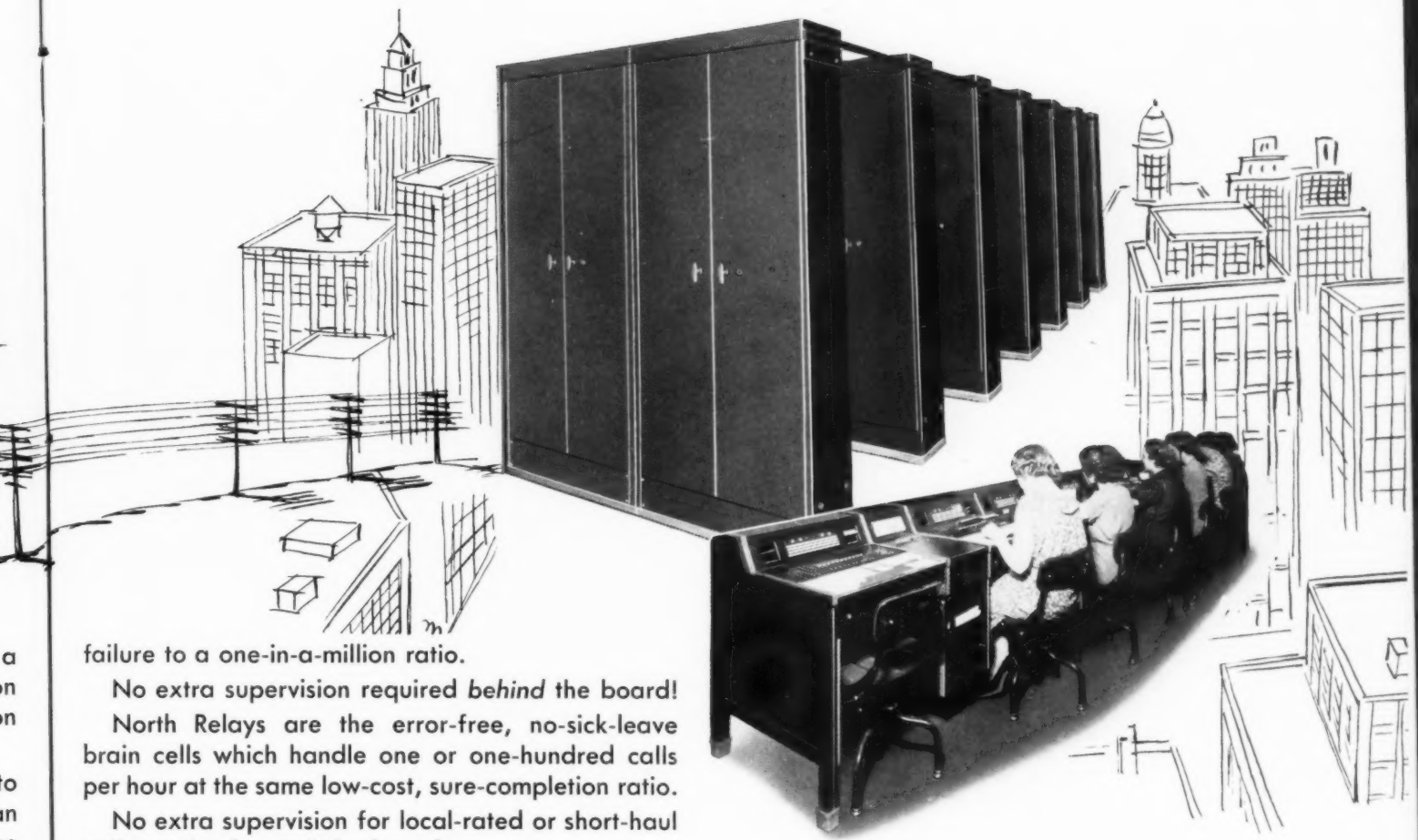


WHETHER your system is a small exchange, a big one or a network, minimized supervision can do a lot to stabilize or improve net returns on plant investment.

The first and obvious step in this direction is to provide automatic equipment. We would like an opportunity to make it also obvious to you that the *right* automatic equipment is North All-Relay . . . to *show* you the basic simplicity of Exchanges in which all "switching" is handled by pre-wired, pre-adjusted relays with mechanical motion reduced to near-zero . . . to *show* you why the use of double, precious-metal points for each contact reduces the chance of

with NORTH

a better NETWORK-



failure to a one-in-a-million ratio.

No extra supervision required *behind* the board!

North Relays are the error-free, no-sick-leave brain cells which handle one or one-hundred calls per hour at the same low-cost, sure-completion ratio.

No extra supervision for local-rated or short-haul calls on the *front* of the board.

The same net-protecting freedom from supervision can apply to automatic station-to-station toll calls by adding North AuTollizer equipment . . . also operated principally by simple relays.

All told, there is a lot more evidence of North ultra simplicity than can be described here. It all adds up to proof of the basic point that you can get better net, with a better network if you make *all* of your equipment automatic, provided you standardize on the *right* automatic equipment . . .

NORTH CX-1000 All-Relay equipment initially adequate for your large exchange, expands easily to large city capacity. North cord or cordless toll boards improve supervised service.

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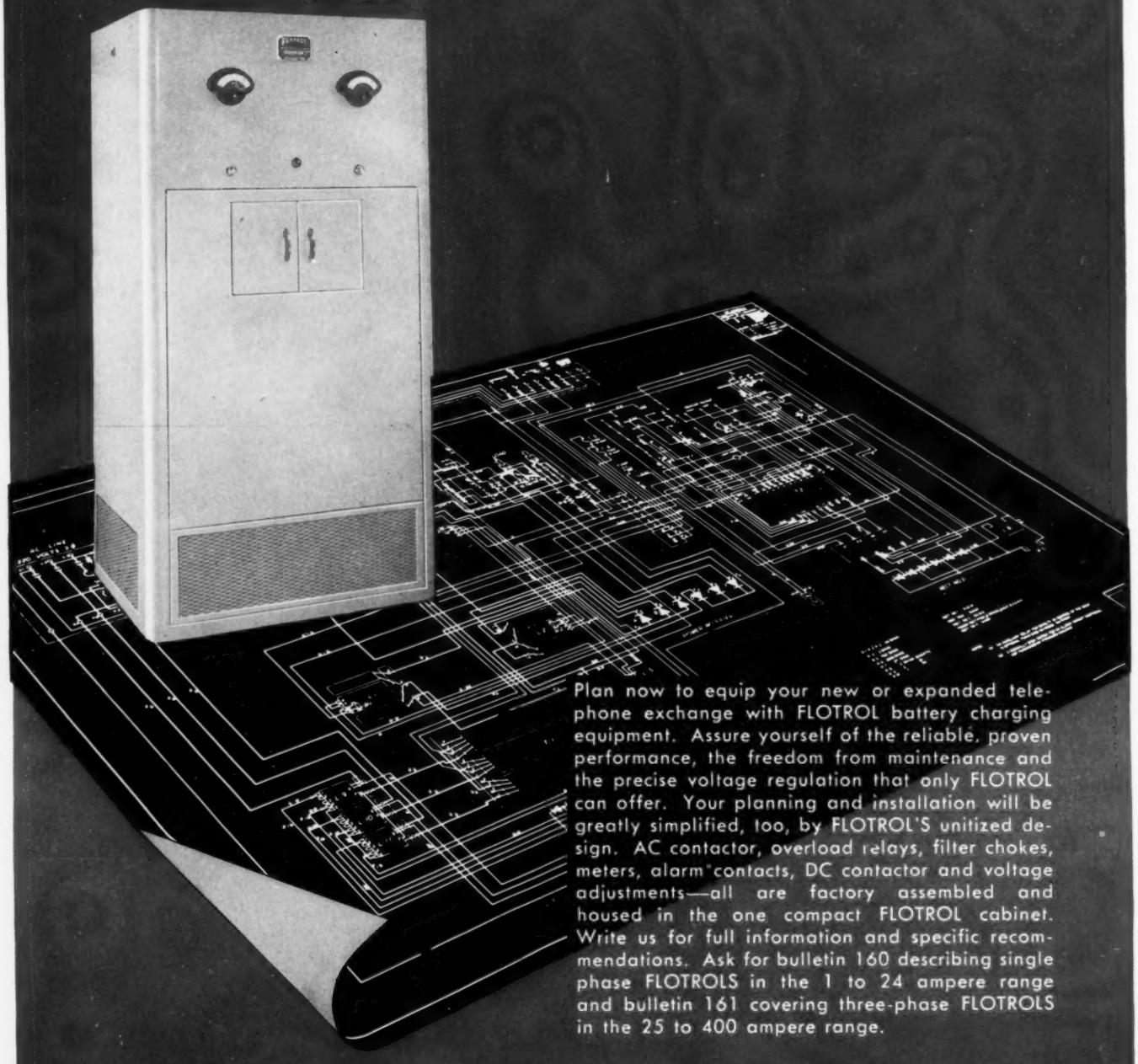

Plan now to equip your new or expanded telephone exchange with FLOTROL battery charging equipment. Assure yourself of the reliable, proven performance, the freedom from maintenance and the precise voltage regulation that only FLOTROL can offer. Your planning and installation will be greatly simplified, too, by FLOTROL'S unitized design. AC contactor, overload relays, filter chokes, meters, alarm contacts, DC contactor and voltage adjustments—all are factory assembled and housed in the one compact FLOTROL cabinet. Write us for full information and specific recommendations. Ask for bulletin 160 describing single phase FLOTROLS in the 1 to 24 ampere range and bulletin 161 covering three-phase FLOTROLS in the 25 to 400 ampere range.

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

President Truman's 'inherent powers' capable of several interpretations . . . urges written limitations. Changes in communications acts likely. TV expansion gets 'go ahead.'

THE COMMUNICATIONS circles have a right to be nervous about the President these days. The seizure of the steel mills, under his alleged "inherent powers" (as was pointed out in this department in the Apr. 19 issue), suggested that there is no reason why the President could not seize the telephone and telegraph industries under the same mystical powers—if he felt so inclined or got the idea that the public good demanded such action.

The telephone and telegraph strikes were still in effect at the time President Truman made a press conference remark, answering a question about seizing the radio stations and newspapers. It gave new reason for nervousness. For some strange reason, the President selected, as a time and forum for this commentary, a special news conference attended by about 400 members of the American Society of Newspaper Editors. They were in Washington for their annual meeting.

Offhand one would think the President would be pretty careful about what he said in front of a convention of the nation's leading newspaper editors. But then one editor asked, "Mr. President, if it is proper to seize the steel mills, can you in your opinion seize the newspapers and the radio stations?" In fairness, it must be said the President did not directly answer with an unqualified yes or no. With a wave of his hand, he said quite sharply that under such circumstances the President has to act for whatever is for the best interests of the country.

The reader can put his own interpretation on what the President meant by that. But there were a good many newspaper editors who left Washington hopping mad because they got the distinct impression that the President felt he could take over the newspapers and radio stations if, in his judgment, public interest required such action. This, it was pointed out by several editors in statements after the conference, is the familiar line taken by dictatorship. The latest example was the suppression of the great Argentine newspaper, *La Prensa*, by President Peron, who professed to act in the interest of the Argentine public.

Of course, the parallel cannot be too frequently stressed that, if the President has "inherent powers" to seize radio stations and newspapers, he has similar powers to seize other forms of communication industries, telephone and telegraph included. On the other hand, it's quite possible that the President didn't mean anything serious at all by his statement. Just a little touch of his old foot-in-mouth ailment.

Can "Inherent Powers" Be Limited?

The trouble in dealing with "inherent powers" is similar to the difficulty of tracking down ghosts. Since they are not specific, or written down anywhere, but remain invisible, in some mysterious form of authority under the President's hat, nobody knows their scope, much less how to limit them. One of the most succinct statements on the subject was recently made by one of the nation's leading labor leaders, John P. Shields, grand chief engineer of the Brotherhood of Locomotive Engineers, who stated:

"In the light of the Cleveland rails decision and the seizure of the steel industry, this nation now is faced with the specter of continued and expanded involuntary servitude unless present seizure tactics are wiped out on constitutional grounds. . . . If men's earnings, profits and collective bargaining, all can be placed in deep freeze without restrictive legislation, we'd better know it as quickly as possible."

The whole controversy lends a point to the criticism that there is something the matter with our American system of absolute presidential tenure. For practical purposes, there seem to be only two ways to curb presidential authority under our Constitution, even though everybody in the country disagreed with the President. The first is to vote him out of office, which can take as long as four years. In any event, Senator Taft (R., O.), and other Republican candidates are taking care of that approach by making an issue of the seizure authority. Assuming that the Democratic candidate will run on President Truman's record, the people will at least have an opportunity to choose.

But that won't settle the matter finally. For example, a "strong" Republican President could resort to "inherent powers" the day after he took his oath of office if he felt like it. The only other course is impeachment, which is very difficult to accomplish and has been tried only once and then unsuccessfully. Impeachment is difficult because it necessarily involves personalities instead of issues and impliedly puts the President's entire party to the test of public confidence. When the chips are down, in such a test, most Congressmen would be inclined to stick with the party even if they "disagreed" with the President.

There is no remedy in the courts, although the courts have tried, on former occasions, when Presidents took action for which there seemed to be no specific authority in the law or in the Constitution. Thomas Jefferson, a "strong" President, took strong action and never had to answer to anyone for it. Since the time of Chief Justice Taney, who decided the Dred Scott decision (prior to the Civil War), the courts seem to have given up any effort to curb presidential authority.

It does seem a little strange that our government and people, who claim to rely on law, should have put up with such vague definitions of the powers of the President through the century and three-quarters of our national existence. The truth seems to be that a good many people rather admire strong decisive action, law or no law.

When President Jefferson purchased the Louisiana territory, he had not a

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shred of law to support his action. But when he went back to Congress, they confirmed the course he had taken. It is hard to see where President Lincoln had any authority to suspend the writ of habeas corpus when the Civil War broke out. That was the time Chief Justice Taney tried to block action and failed. President Roosevelt time and again took chances in doing what he felt was necessary to meet "emergency" conditions. Congress and the public always eventually approved. All this means is that it is almost impossible to prevent a determined Chief Executive or even an impulsive one from behaving like a dictator on occasions.

But if some President, perhaps Truman, would just sit down and write out what are the "inherent powers," it would help a lot. At least we would know what the score was on the status of property rights in the enterprise system.

Communications Act Change Likely

Contrary to earlier indications, it now appears that the House may finally act on the Senate-approved bill to amend the Communications Act. But the bill (S. 658), which finally emerged from the House Interstate and Foreign Commerce Committee (and at this writing awaits clearance by the House Rules Committee), is a far cry from the series of two-fisted FCC reorganization bills which failed to get any action in former years. In fact, there is very little in the pending bill of particular interest to telephone companies except streamlining some hearing and appellate procedures. Since that is what lawyers get paid for and it is pretty dull stuff at best, most other people would rather not hear about it.

Suffice it to say at this point that the bill is watered down from earlier versions which sought to overhaul the staff and operating setup of the FCC from stem to stern, reorganizing it into two or three panels (there were several bills over the years) and separating telephone regulation from radio broadcasting and other forms of communication regulation. Background of all this was a strictly radio broadcasting controversy, started by dissatisfied radio station license holders and applicants.

The latest bill deals principally with the regulation of radio broadcasting licenses and the procedure for granting such licenses and construction permits. The bill gives the Federal Communications Commission new administrative powers to secure compliance by license holders through penalties, in addition to the power to revoke licenses, which it now has. The bill also gives the chairman of the commission power to assign staff work and represent the commission and otherwise function as its executive officer.

Somewhat along the same lines is another bill passed last week by the Senate to get more security of tenure for federal regulatory commissioners. This is an old Hoover commission reorganization recommendation which put a limit on firing federal regulatory commissions and also provided for holdover commission members. The bill applies to the three major federal regulatory agencies: Federal Communications Commission, Federal Power Commission (FPC), and Securities & Exchange Commission, and several others not directly concerned with utility regulation.

There are two separate provisions of the bill (S. 1139): First, members of these commissions could be removed by the President only for a cause (inefficiency, neglect of duty, or malfeasance in office). Secondly, members of these commissions, whose terms have expired, would be permitted to hold over until a successor has been appointed and qualified—but not longer than 60 days after the expiration of their respective terms.

The "holdover" provision recalls several incidents in which members of the commission had to serve without pay and sit on the anxious seat for months before the Senate got around to confirming their reappointments following the expiration of their terms. One of these, Leland Olds, chairman of the FPC, never did get confirmed. In another case, involving a new appointment to the FPC which failed to get Senate approval, the FPC functioned with four members for several months. During this time the commission was faced with the necessity of making decisions on several closely divided questions. Nobody knew from one day to the next which half of the commission was running the works and which half

(Please turn to page 60)

REA Approves $781,000 for Loans in Two States

The Rural Electrification Administration approved $781,000 in telephone loan allocations during the week of Apr. 7 to 12.

On Apr. 9 $76,000 was allocated to Fredericksburg & Wilderness Telephone Co., Chancellor, Va., the second loan to this borrower, to be used to build 17 miles of new line, serve 232 additional subscribers, install another dial exchange about four miles west of the present exchange, and rebuild nine miles of line. These new facilities will be built entirely within the territory of the present system.

The first loan, approved on Apr. 11, 1950, was for $55,000. At the time the company was providing magneto service to 170 subscribers over 40 miles of line. Calls to Fredericksburg, the major trading center, cost 10 cents. The 1950 loan was intended to be used to convert the system to dial, build another 38 miles of line, and add 130 subscribers, of which 40 were then on the waiting list. The toll charge for calls to Fredericksburg was eliminated.

When the company's new dial equipment was ready in September, 1950, it was the first REA-financed telephone system to go into service. The system now serves 370 subscribers, considerably more than originally contemplated.

* * *

Millington (Tenn.) Telephone Co. on Apr. 11 received an allocation of $705,000 to improve and expand telephone service in Shelby County, Tenn. This loan will enable the borrower to make the necessary system modifications in its present common battery service to provide service for its rapidly expanding rural residential area. The company plans to build 38 miles of new line, rebuild seven miles of existing line, convert the Millington central office to dial operation, and add 2,612 new subscribers. About 11 miles of the old line will be retired.

When the expansion and improvements made possible with this loan are completed, the system will be operating 78 miles of line furnishing about 3,200 subscribers with dial telephones.

NOTE: The name of the borrower in Haddam, Kan., to which REA recently approved a telephone loan, has been changed from "Courtland, Haddam and Morrowville Telephone Co." to "American Communications Co.," according to an REA notice dated Apr. 17 (TELEPHONY, Aug. 18, 1951, p. 14).

ABC of the Telephone

By FRANK E. LEE

THE TREND in telephone service is to dial. All across the country, in small towns, in large cities, in remote out-of-the-way places, dial switching systems are handling millions of telephone calls daily. One of these calls may be to a neighbor across the street or on an adjacent farm. The next call —well, it may be to most any place in the country.

In the middle of the morning, or just before dinner in the evening, or especially during the long hours of the night, the familiar sound of dial tone is a reassuring, welcome note. Every advancement and each small improvement helps to achieve the perfection in service towards which all telephone people strive. To this end, dial switching systems have contributed a full share.

A considerable number of new dial offices are built in small communities. Many small companies operating from one to four central offices are making use of dial units designed for their particular needs. Usually these offices are "unattended dial exchanges" or "community dial offices." These offices operate with only occasional visits by maintenance personnel.

[**NOTE:** *A "community dial office" (CDO) is an unattended exchange trunked into a neighboring exchange (either owned by the same company or one owned by another company), which provides toll service, and exchange operating services such as assistance, information, intercept, repair, emergency, etc., for the CDO. The exchange providing such services is called the "control center," and, if it is a "foreign" exchange (owned by another company), the work is done under an agreement covering specific exchange operating services to be performed, as well as a basis for settlement.*]

PART 58. COMMUNITY DIAL OFFICES (CDO)—Section I. The preceding article in this series appeared in the Jan. 26 issue, p. 13.

Without going into the selection of the dial equipment, there are still many other factors which must be considered when a community dial office (CDO) is built. This article and others to follow will discuss those factors.

The CDO, like any other type of telephone exchange, is the nerve center of a community. For this reason, every logical precaution should be taken to enable the CDO to remain in operation in times of stress and emergency as well as under ordinary conditions. The public trust and confidence that have been placed in the operating company should be a strong incentive to inspire planning the new CDO to best serve the public interest. Worthy of comment is the fact that what is best for the public interest usually is also best for the telephone company's interest.

General Location of the CDO

As a rule, the actual location of the CDO is dictated by the economics of a wire center rather than by general topographical conditions. However, in making these decisions a number of general and specific details concerning the actual site must be considered.

When other conditions are equal, the choice between one or more sites can be made on an actual cost basis. After the various lengths of subscriber loops are plotted, there usually are a number of general locations which would be suitable for the new CDO.

In many instances, the CDO is needed to serve a smaller community where demands for service are increasing beyond present plant facilities. As an example, *Fig. 1* illustrates that the present exchange located at "A" serves 1,050 main stations, distributed as follows:

Area	CO terminals
A	785
B	50
C	75
D	140
Total	1,050 CO terminals

A new aluminum processing plant is being constructed at "B," with an estimated requirement of 18 central office terminals. However, the most desirable site for new home construction is in area "C" and permits have been issued for 200 family units. It is estimated that immediate demands for service in area "C" will be for 130 two-party lines and 75 individual lines, or a total of 140 central office terminals.

Also, the present outside plant facilities in both areas "B" and "C" are working at capacity and some type of new construction is required to meet the new service demands. To round out the existing condition, the switchboard at "A" is working at near capacity. Therefore, this means that ex-

This article is the first of a series on the all-important subject of construction of unattended dial exchange buildings, which should be "must" reading in all telephone companies — especially smaller companies which today are considering the installation of CDO offices. Make sure you will have all the future articles. Use the special offer subscription blank on page 54.

pansion of both central office and outside plant facilities is required.

The total demand in areas "B" and "C" is as follows:

Service Requirements in Central Office Terminals

	In Service	*Demand*	*Actual*
AREA B	50	18	68
AREA C	75	135	210
Total	125	153	278

All of these factors must be considered when a location is being selected for the new central office. So far, the facts of the problem are as follows:

(1) Central office at "A" is working at capacity.

(2) Principal growth is confined to area "C."

(3) Aluminum processing plant being erected in area "B."

(4) Outside plant facilities to both areas "B" and "C" are working at capacity. Distance from "A" to area "C" is five miles, and from area "A" to "B" is eight miles.

(5) 153 new terminals are required immediately, and at least an additional 10 per cent should be provided for growth.

One of the first things that must be done is to recognize the basic problem that a substantial plant expansion program is involved. Under conditions similar to the example presented above, the sooner this important factor is recognized, the greater will be the time available for planning and construction work. This fact is important in view of the broad decentralization of basic industries program which is under way in this country. In this example, the expansion must be on a more or less wholesale basis and speed is the essence of the program. In other localities, the normal expansion over a longer period of time may create the same problems for the telephone company.

New central office switching facilities must be provided. This would require building either an addition on the present building or a new building. If the new building and equipment were located at "A," additional outside plant would have to be placed from "A" to "C" and then to "B." The number of pairs involved would make this method of expansion a substantial investment.

If the new CDO were to be located in area "C," building and central office equipment costs would be about the same as for a new building or addition at "A." The present outside plant between "A" and "C" could be converted to serve as trunk facilities and supervisory circuits between the existing office and the new CDO.

With this arrangement the present central office at "A" would serve as the control center for the new CDO at "C." Also, when the present lines in areas "B" and "C" are transferred to the new CDO, 125 central office terminals would become available for normal growth in areas "A" and "D."

Actually, the new CDO at "C" is a primary step in expanding the company's facilities. A second logical step would be to erect a small CDO at "D" at a future date. This would provide 140 additional terminals for the use in area "A." In this event the basic outside plant expansion would consist of increasing the facilities between "C" and "B." The erection of the new building at "C" instead of at "A" would eliminate the cost of adding over 150 cable pairs between "A" and "C."

In the foregoing example, the economics of a wire center control the general location of the new CDO. Also, area "C" offers a certain degree of security advantages as compared with area "B." This fact is apparent when it is remembered that the new aluminum processing plant in area "B" is an example of an essential industry that would be a primary target in the event of an enemy air attack on our country.

Selecting the Specific Location

After the general location for the new CDO has been chosen, the next step is to select the specific location. As a rule, decisions on this phase of the process of selecting a site can also be based upon several concrete facts. All of these factors should be considered as a whole, and the importance of each factor is bound to vary with each individual area.

When other factors are equal, the decision to select a particular location can be based upon the availability of land at low cost. Along with the comparison of the cost of two or more parcels of land, consideration should also be given to certain other cost figures. These are as follows:

(1) Are there likely to be substantial differences in actual building costs because of differences in soil structure?

(2) Which location will require the least amount of capital expense to connect the distribution plant into the central office?

(3) Are there any right-of-way factors that should be considered?

Adequate fire exposure protection should be given careful consideration in the selection of the site for the new office. A desirable minimum size would be a lot 50 feet by 100 feet. However, a smaller plot may suffice under unusual circumstances.

A heavily wooded section should be avoided. The primary dangers in these areas are possible damage from fire or falling trees. While a few large trees may not constitute a wooded area, they do present some hazard if they are too near the CDO. Large trees on company property which would damage the building if they fall should be removed. More suitable trees for landscaping are ornamental evergreens of the arbor vitae varieties, various branches of the juniper and phitzer families, ground creepers, and any of a number of shrubs and bushes.

Areas which may be subjected to severe floods should be avoided. This consideration is important both from a savings in dollars and cents, but also because of the need to safeguard the service.

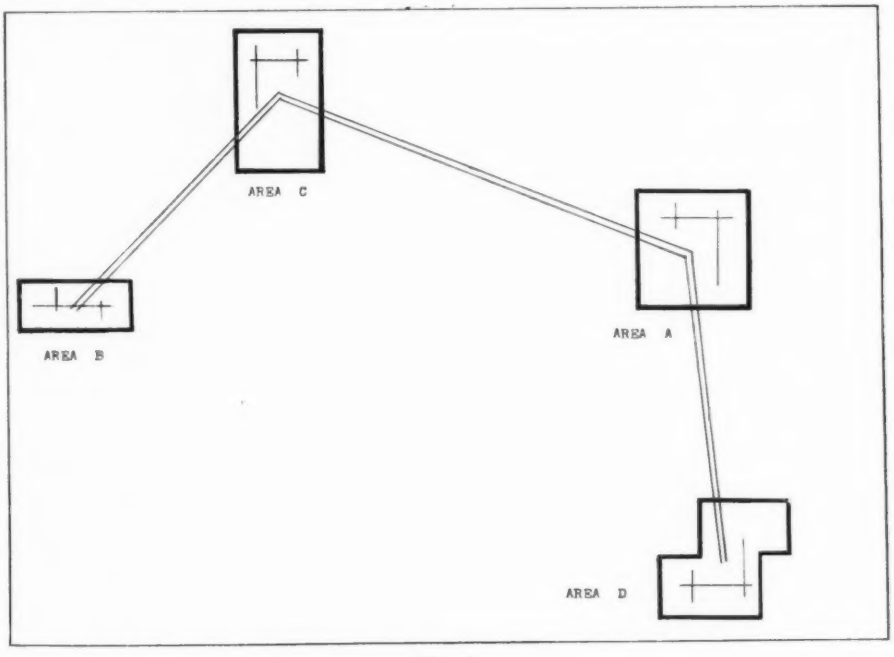

Fig. 1

Floods may be caused by a river overflowing its banks during the spring thawing season, by prolonged rain, or may be of a flash variety such as would occur if a power dam were washed away. Under any of these circumstances, telephone service is urgently needed. Every precaution should be taken to make sure that service can be maintained. Many of these precautions start with the decision of where to locate the CDO.

Wherever there is any question regarding flood possibilities, specific information should be gathered from reliable sources. For this purpose, information can be secured from local weather records, newspaper files, and geological survey charts.

While on the subject of weather conditions, the location for the CDO should be accessible during any season of the year. This would indicate that the office should be on a public road or street. This type of location is preferred to a site in the center of a field or at some distance from a highway.

A secondary street location in a small community is most satisfactory. Property is less costly; also, there is less traffic vibration on a secondary street than on a main street or highway. Another factor favoring the secondary street is that ample parking space will be available.

A residential area is often preferred for the CDO as compared with an industrial zone. As mentioned previously, there is a reduced security risk in the residential area. There is less dust in the air, and the building is subjected to less vibration than in an industrial area.

When a CDO is located in a residential area on a secondary street, the exterior of the building should fit in with the general pattern of the neighboring homes. The building may not be as large as the homes around it; however, certain features such as the entrance, the use of brick and stone, the exterior trim, or even the type of roof, will help make the new building fit in with buildings in the neighborhood.

For example, the CDO shown in *Fig. 2* is a modern building which will blend in well with practically any residential area. An interesting landscaping effect has been gained by allowing two native trees to remain standing.

Good public relations can be built by showing the immediate neighbors sketches of the new building. Show them how the building will look when it is completed. If possible, stand with them on their own porch or in their yard and explain how the telephone company plans to improve the property. These are considerate gestures on the part of the company, and they demonstrate friendliness and sincerity. A few moments of explanation at the start of the project will go a long way towards cementing good public relations for the future. Once the immediate neighbors are sold on the project, they will become valuable boosters in pointing out the advantages of the new building to their friends and other home owners in the area.

Fig. 2

If the telephone company is conscious of the foregoing elements of good public relations, the over-all plans work out better. This will be true not only of the plans for the new CDO building, but these considerations will also have a good effect on other plans.

It may be that the only available site will be on a main street or through highway. In this event the building should be set back on the lot as far as possible. Usually the amount of setback is governed by local ordinance. In some places good taste in locating the building to conform with existing structures may be the governing factor.

When the building must be placed on a main highway, a location on a straight-away section is much more desirable than on a curve. A primary requirement of highway location is a driveway of ample size to facilitate safety as vehicles turn from and enter upon the highway.

An averaged-sized CDO building is usually quite small. For this reason, foundation requirements are about the same as for a small home. In most instances a solid foundation is quite easily secured. In the exceptional cases, such as over peat, sand, and similar light soils, a solid foundation may be unduly costly. For this reason an estimate of foundation costs should be added to land prices when two or more sites are being considered.

Another item which may have a bearing on the actual cost of the selected site is how much cutting or filling is required to establish the desired grade. Based on these considerations, a site which requires a minimum of cut or fill and which has good drainage is desirable.

When all of the requirements of a good site for a CDO are considered as a whole, a location on a secondary street offers the most advantages. This decision is logical because the CDO should house only dial switching equipment. Business office quarters and storage space are usually provided in other quarters.

Construction details of the CDO building will be included in forthcoming articles in this series.

(To Be Continued)

IN THE LINE OF DUTY

When Mrs. Douglas Gross, operator on duty at the exchange of Alaska Telephone Engineering Corp., Wrangell, took a fire call recently, it was to hear that her own home was burning.

Others in the telephone office said Mrs. Gross appeared to be the calmest one on the staff, according to Frank E. Webb, manager. She blew the fire siren and then announced calmly over the loud speaker connected with the fire hall:

"The Douglas Gross home is on fire," and went back to her switchboard—as she was the only operator on duty at the time.

Her mother-in-law, Mrs. Bessie Gross, telephoned in the alarm from her home across the street after she saw sparks coming through the shingles on the roof.

The fire department responded and quickly extinguished the flames before any great amount of damage occurred. Cause: An over-heated stove. Mrs. Gross received a report on the fire damage after it was all over—and went on answering numbers.

XUM

Insulation — Its Importance In the Telephone Plant

By DANIEL SEITZ
Plant Superintendent
York (Pa.) Telephone & Telegraph Co.

[EDITOR'S NOTE: *In response to the many requests that* TELEPHONY *publish the illustrated address of Mr. Seitz before the recently held Minnesota telephone convention, we are presenting below his comments on insulation and the photographs he used for illustrations.*]

A FAMILIAR paint advertisement says: "Save the surface and you save all." We in the telephone business say: "Save the insulation and you save all." Before attempting to emphasize the importance of insulation, we would like to call special attention to one other item which accounts for a large percentage of service interruption, and which fortunately can be eliminated.

Cable Protection

Two methods of cable protection designed to prevent lightning and power damage to the cable are shown in *Fig. 1A* and *Fig. 1B*. *Fig. 1A* shows the familiar fuse and discharge blocks with the terminal ground wire connected to the sheath and/or a made ground. In five small rural exchanges of one company, with a total of 2,207 subscribers, over a two-year period 32 per cent of all trouble between the central office and the subscribers' service entrances were caused by open fuses at the terminals.

To correct this condition, the method shown in *Fig. 1B* was adopted which eliminated cable terminal fuse troubles, simply because there are no fuses involved. Details of this method will be discussed later.

After eliminating this fuse trouble, over 90 per cent of all remaining troubles were caused by insulation failures.

The following four specific suggestions, if followed, will result in less maintenance expense and provide good service to the subscriber:

(1) Choose the best quality material consistent with cost and available funds.

(2) Apply modern approved construction methods.

(3) Adopt preventive maintenance methods in every plant department.

(4) Make all repairs permanent. Temporary repairs frequently become permanently temporary.

Open Wire

Fig. 2 is an illustration of good and bad open wire insulation. It shows what often happens when insulators, like "1" and "2", do not have sufficient clearance between the skirt of the insulator and the wood pin to provide adequate insulation in wet weather.

Furthermore, spiders and other insects build webs in the dark space between the insulator skirt and the wood pin, providing an additional path between wires and to ground in wet weather.

Such poor insulation may not cause trouble on certain types of circuits; however, with the ever increasing power distribution lines, such conditions frequently become unbearable.

Five years after insulators "1" and "2" in *Fig. 2* were installed, they had to be replaced at considerable expense with insulators like "3" and "4", which have greater clearance between the skirt and wood pin.

We have a definite purpose in presenting this illustration which will become evident later.

Loop Wire

It is difficult for us to judge, even from experience, just which insulated wire will last the longest, usually because most of us do not keep accurate mortality records of our loop wire. A familiar sign along a certain highway says: "If you don't know furs, know your furrier." We might paraphrase that by saying: "If you don't know insulated wire (and most of us do not), then know your manufacturer and supplier."

Cable

Inasmuch as cable represents a sizable investment in all but the very smallest telephone plants, it is important that we get the best possible quality. We can readily determine the gauge of the wire and the quality of the paper insulation, but what about the lead sheath which is perhaps the most perishable part of aerial lead cable?

The antimony content of lead sheath is an extremely important item. Present-day specifications usually call for about 1 per cent antimony with commercially pure lead, and we should insist upon tolerances of not more than one-tenth of 1 per cent plus or minus, or, in other words, nine-tenths of 1 per cent to 1 per cent lead and one-tenth of 1 per cent antimony content. (See *Figs. 3, 4, 5* and *6* for examples of good and poor sheath). Perhaps we have never considered the sheath of a cable, especially lead sheath, as an

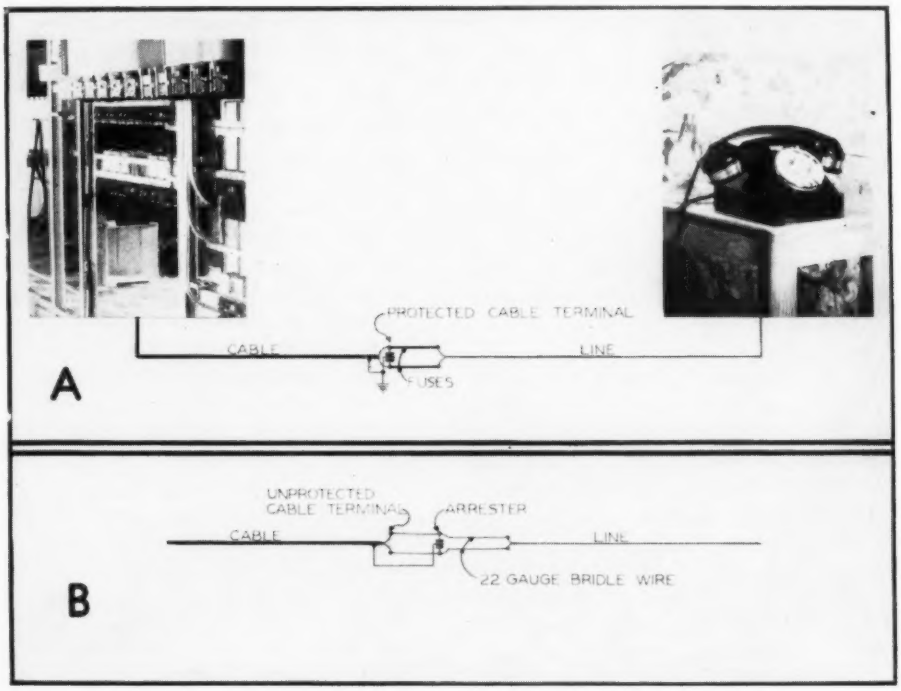

Fig. 1A and Fig. 1B. Schematic diagram of two cable protection methods.

insulator. However, that is exactly what it is as it insulates the wire from the elements.

All of us are aware that poor construction and maintenance of aerial cable are frequently the cause of sheath failures. However, if the content of the sheath is not what it should be, no amount of care will prevent sheath breaks.

If the aerial cable has been properly supported and if numerous sheath breaks occur along its entire length, it will be safe to assume that the fault lies in the quality of the sheath. On the other hand, if an occasional break occurs at a neglected point, it more likely will be caused by a construction or maintenance fault.

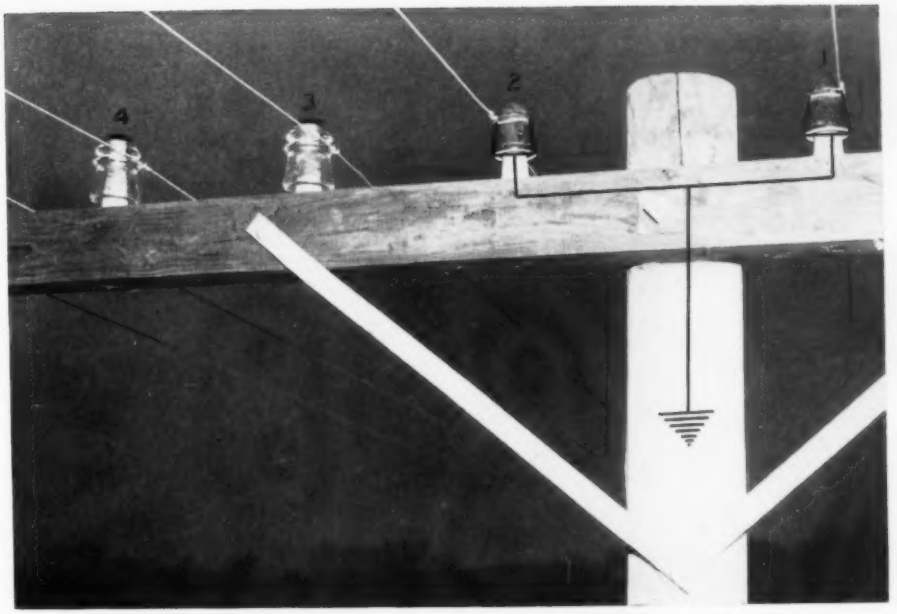

Fig. 2. Good and poor open wire insulation.

Central Offices

Discussion of central office insulation would be too involved except to point out several features that should be incorporated in every central office. Adequate, dependable lightning protection, and protection as a safeguard in the event of power-line contacts with telephone circuits should be provided (see *Fig. 7*). Special attention should be given to the elimination of moisture, as many small central office buildings are moisture traps.

A system of properly controlled outlet ventilators placed near the ceiling, with inlets installed near the floor, which allow dry air to circulate in good weather, and which permit the closing of ventilators when excessive moisture is present in the air, seems to be the best solution to the moisture problem. Ventilators in unattended dial offices may be operated by remote control from a test desk or another office.

Construction

We have referred briefly to certain features which we feel should be kept in mind when choosing line, loop, cable and central office insulation.

Now we would like to call attention

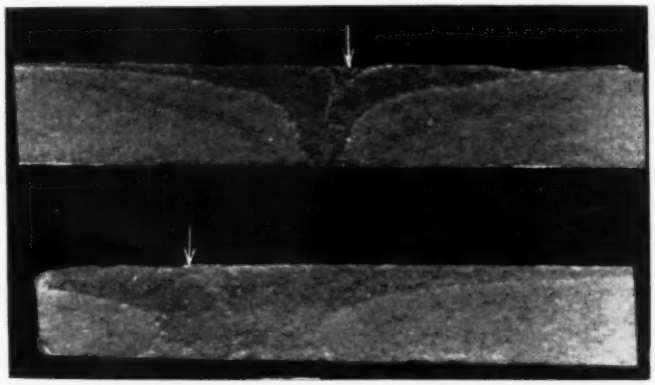

Fig. 3. Photomicrographs showing cross-section of cable sheath welds. This cable is five years old, with antimony specifications of 1 per cent. Antimony content is .683 per cent, and the Brinnell hardness rating is 7.15. There has been no trouble with the sheath, although the welds (arrows) might not be perfect.

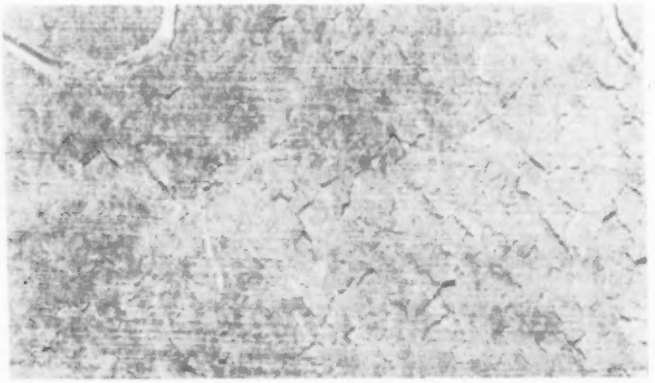

Fig. 4. This shows what happens when the sheath does not contain the proper amount of antimony. While the antimony specified was 1 per cent, it contained only a trace, and Brinnell hardness rating is only 3.85. Service record of this cable is bad, showing sheath breaks which caused service interruptions.

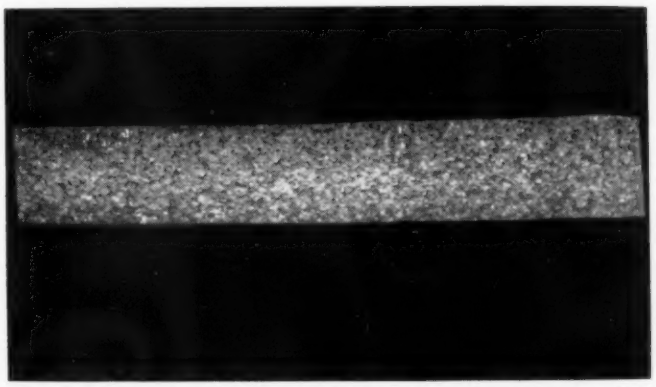

Fig. 5. Cross-section of lead sheath in aerial service 34 years. Antimony content is .910 per cent and Brinnell hardness rating is 7.50.

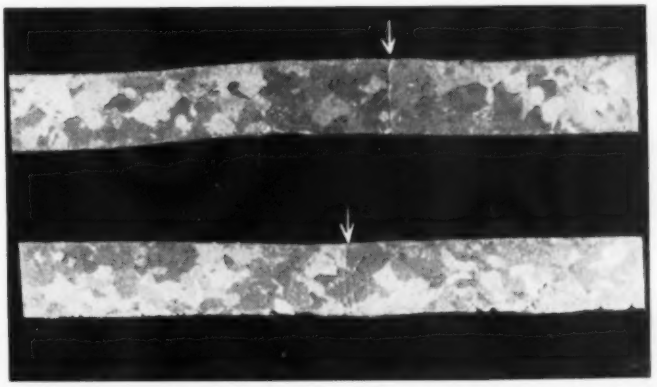

Fig. 6. Cross-section of photomicrographs of poor sheath causing short life of cable. This cable, having only a trace of antimony and Brinnell hardness rating of 3.85, was junked after 15 years of service.

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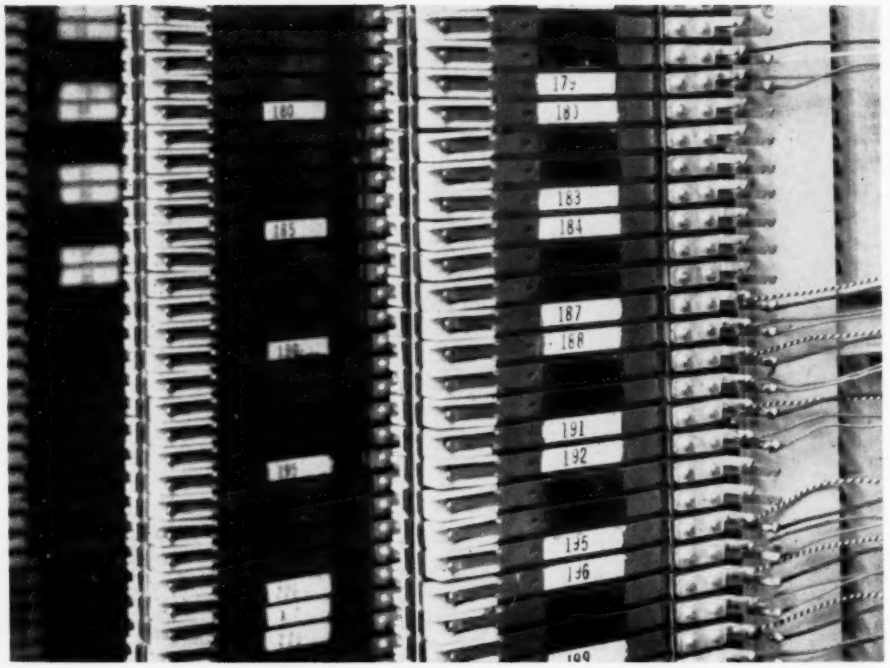


Fig. 7. Modern central office protection without fuses or heat coils for offices where all cables enter for some distance via underground.

to the application of modern approved construction methods, beginning with loops and insulated wire.

With insulation being the most perishable part of loop wire, it is essential that we protect it in every way possible. Here are several suggestions:

(1) Keep wire clear of trees and other objects which might cause abrasion.

(2) Adopt a method of attaching the wire to the support so as not to injure the insulation.

(3) If ties are used, do not draw them too tight.

(4) Tension each wire so that the sag is uniform and will prevent wires from swinging together (see *Fig. 8*).

(5) Last, but by no means the least, do not pull loop wire too tight—about a 24-inch sag per 100 feet of loop is a good rule to follow for proper loop tension.

Fig. 9 shows the effect of loop tension loaded and not loaded, and also what the suggested sag per 100 feet of loop should be.

We should bear in mind that the insulation, together with the wire, supports the loop; therefore, any elongation of the loop because of excessive tension will adversely affect the insulation. Excessive loop tension is also frequently the cause for loop failures at supports.

Cable Support

Assuming that good aerial lead sheath cable has been purchased, how shall it be installed and maintained?

It is generally agreed that lashing the cable to the strand is the most satisfactory method of supporting aerial cable yet devised; however, we must have a strand at proper tension to begin with, and the only way to be certain that we have proper tension is to use a dynamometer. Guessing about tension just won't do.

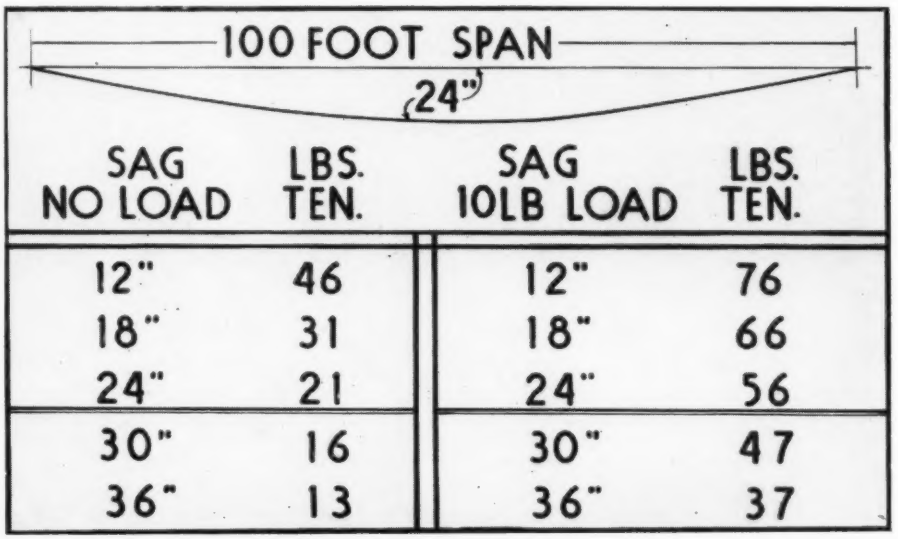
The correct aerial cable and strand tension may be obtained by adjusting the sag in the following manner:

(1) Place the strand at near the correct tension holding it in that position at the point of pulling; (2) increase or decrease the tension as the cable is being placed on the strand; (3) as each span of cable is placed on the strand adjust the sag properly, and make the strand clamp on the pole secure.

Too much tension on the strand is the major cause of buckling of cable. Buckling causes sheath breaks; sheath breaks allow moisture to reach the wires, causing shorts, crosses and grounds.

Yes, strand tension is very important, whether the cable is supported by rings or lashed to the strand. Lead spacers, zinc bands and lashing wire clamps are available for making a good safe job adjacent to the pole.

Regardless of how well the cable installation job is done, failures may occur at any time and we should be ready to cope with them. Many potential cable failures may be detected, while they are in the making, by visual inspections of the cable, making it possible to correct them before they have had an opportunity to cause service interruptions. There are, however, mois-



SAG NO LOAD	LBS. TEN.	SAG 10LB LOAD	LBS. TEN.
12"	46	12"	76
18"	31	18"	66
24"	21	24"	56
30"	16	30"	47
36"	13	36"	37

Fig. 9. Loop tension and sag with and without 10-pound ice load.

Fig. 8. Wrong way to sag loop wire. Abrasion and early failures are caused by wires swinging in the wind.

Fig. 10. Battery and receiver method for locating high resistance cable faults.

ture faults caused by sheath breaks, etc., that can only be detected in the early stages of development by making insulation tests of the cable pairs.

For the larger plants the electronic insulation tester is ideal. Simple inexpensive equipment, suitable for testing small plants, is also available, or can be designed and built. With testing equipment, several hundred cable pairs may be actually checked in rainy weather for faults in the making in a matter of minutes. Supposing that we find a moisture fault developing on a group or count of pairs. How would we proceed to locate and clear the trouble?

Fault Analysis and Location. First, measure the resistance of the fault between individual wires and to the ground. The multimeter used as an ohmmeter is ideal for checking the fault resistance before connecting any fault locating equipment to the pair or pairs. It will quickly tell us whether or not we can locate trouble by this method.

Now, after we have analyzed the trouble, we still need a means for locating the trouble; therefore, in addition to the ohmmeter, we should have a tone and exploring coil outfit for locating the kind of trouble for which the equipment is adapted.

It must be remembered that not every case of wet cable trouble can be located by the tone and exploring coil method. Failure to locate wet faults by this means is usually due to the excessive resistance of the fault.

One of the simplest ways to locate high-resistance faults is the battery, receiver, and tapping method, connected as shown in *Fig. 10.* When the cable in the suspected area is tapped, it will be heard in the receiver. The tapping sound will become the loudest at the location of the fault. This method is ideal for checking suspected terminal stubs, etc. Hard-to-see sheath faults also may often be located by connecting the battery and receiver to a pair in the terminal and tapping the cable in the suspected area.

How often have we had a case of trouble narrowed down to a span or two with the fault rapidly drying out and no visible evidence of a sheath break. The tapping method is a real help in such cases.

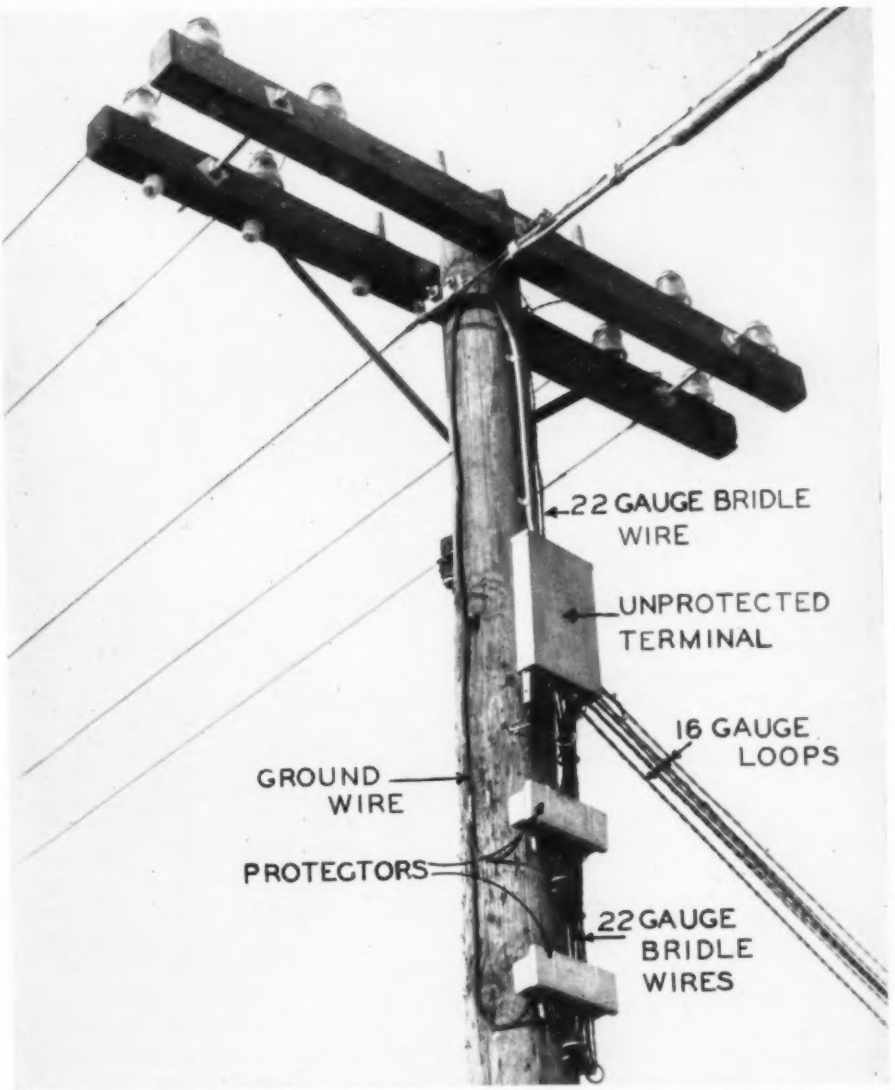


Fig. 11. Typical cable terminal and protector installation using 22-gauge bridle wires.

Loop Pairs for Testing. We are definitely opposed to the promiscuous use of loop boxes in cables. However, on long cross-country installations, looping several pairs at intervals along the route provides quick access to these pairs when all pairs in the cable are affected by moisture. This allows quick localizing of the trouble between any two loop terminals.

A well insulated wire of sufficient length to reach from any one loop terminal to an adjacent one will provide a clear wire for using the bridge method of fault location.

A steel reel with provisions for attaching it to a cable repair truck provides a quick means for running out the test wire. Far too many plant men regard the Wheatstone Bridge as a highly complicated instrument for use in locating cable trouble. Perhaps this

(Please turn to page 62)

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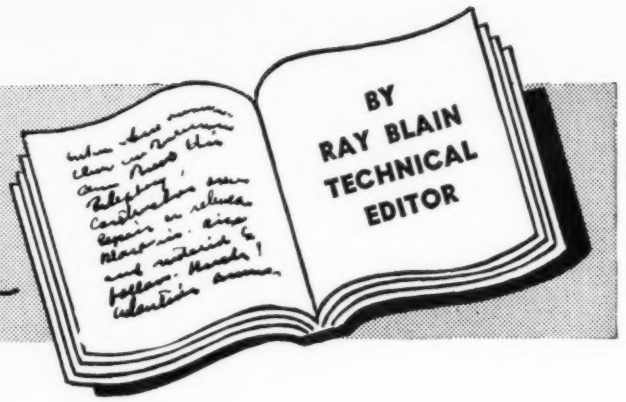
THE PLANT MAN'S *note book*



BY
RAY BLAIN
TECHNICAL
EDITOR

IN THE MARCH 8th issue, we mentioned the fact that a reader had recently requested information concerning the use of salt licks in the prevention of squirrels from eating lead-covered cable. We had never heard of this method and so asked help from any of our readers who might have had experience with this particular method.

Now word has come to us that the Mountain States Telephone & Telegraph Co.'s crews have been spending their working hours lately, in parts of Colorado, nailing blocks of salt to cable-carrying poles. It is their hope that the squirrels will decide that the mineralized salt tastes as good as the minerals on the cables.

The above-named company purchased four-ounce blocks of salt which can be nailed on poles and on overhanging tree limbs on property where the owners have granted permission to experiment with this treatment. Squirrels, although enjoying local popularity, have been gnawing lead-covered cables in this section lately and the company chose the use of the salt blocks as a means of protecting telephone property without injuring the squirrels.

• • •

There was a time when it was thought that a 400-pair 22-gauge cable was about the largest size that could be aerially maintained in a satisfactory manner. Later, however, this was increased to 600-pair, and larger, until, at the present time, we understand that it is not uncommon in some sections of the country to string 1,200-pair, 24-gauge cable aerially.

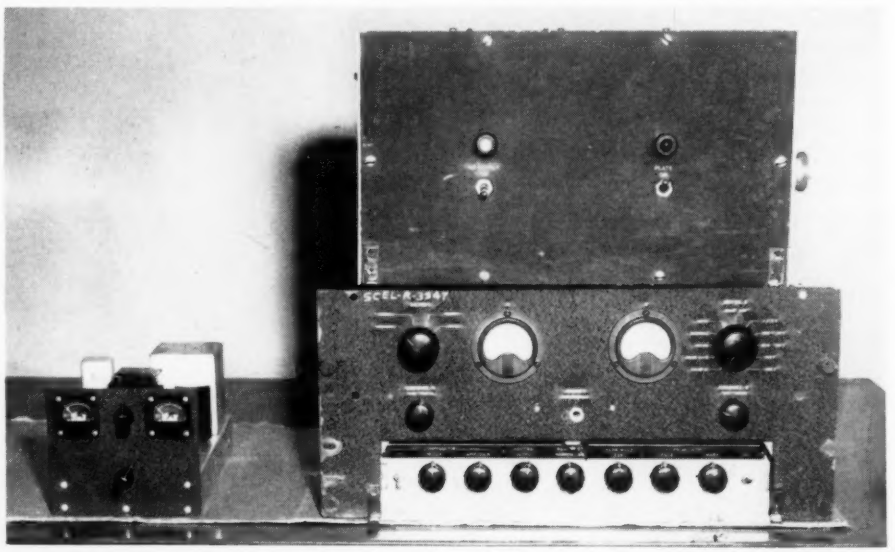
Plastic-jacketed cable in the larger sizes, because of its light weight, is generally preferred to the lead-covered type when large cables must be installed aerially.

• • •

The writer had an opportunity recently to inspect some 150-foot laminated poles which are to be used to support rhombic radio antennas. These poles appear to have many advantages over the type which nature provides, in that proper strength can be built in at the points desired. Further, they are made in sections which permit economy and ease of transportation.

• • •

An important step in the development of small, light military communications equipment has been accomplished by the use of transistors instead of vacuum tubes.



The transistor is a germanium crystal which will amplify any alternating current, including radio signals.

Developed by the Army Signal Corps, the new transistorized equipment is a miniature "converter" used with radio-teletypewriter equipment to change radio impulses to the kind of electrical current required to actuate a teleprinter. It requires only about a one-hundredth part of the current needed for equipment now in use. The transistorized converter weighs only 10 pounds, compared with about 100 pounds for comparable equipment now in service, and will help bring printed messages much closer to the front lines. (See cut. New converter at left.)

Transistors, developed by the Bell Laboratories in 1948, perform many of the functions of vacuum tubes, but do not require power for heating filaments. Consequently, they use much less current. Power for the new converter, about one and one-half watts, is supplied by ordinary dry cell batteries. The 175 watts of power for conventional type converters is supplied by heavy and expensive generators in mobile units.

Estimated life of the type of transistors used in the new converter, if employed 24 hours a day, is about seven years. Vacuum tube life is much less. Transistors are solids, permitting the new converter to withstand greater vibration and shock than vacuum tubes.

Filament failure has been a major cause of vacuum tube unreliability.

• • •

David Sarnoff, RCA board chairman, states that by next election day there will be 18 million TV sets in use, with a potential audience of 60 million.

• • •

New type plastic screw anchors are claimed to be suitable for use in all types of solid materials such as brick, wood, concrete, glass and metal. They are exceptionally light in weight, are corrosion-resistant, non-magnetic, have low thermal conductivity, and serve as electrical insulators.

PLANT MAN'S QUIZ

Q. We are planning some rural line construction and wish to consider long span construction. Will you please advise the greatest length span that may be satisfactorily used on this type of construction?

A. This is a rather difficult question to answer since local conditions must be considered in each case.

The new HTL-190 high tensile strength wire, designed for long span construction, combines extraordinary strength with effective voice transmission qualities. It is practical to provide spans up to approximately 600 feet in all loading areas, heavy, medium and light, with this wire. This wire is No. 12 B.W.G. with a minimum breaking strength of 1,800 pounds.

Lines making use of these extra long spans may utilize the same construction practices as are ordinarily used for regular telephone lines except that a few precautions must be observed to care for the greater weight of the wire on the points of support and for greater line tensions. All corner and dead-end poles should be properly guyed to hold the high tensions. Poles also should be of the proper height and carefully located at road crossings and other points of interference so that, if the wires of the long spans sag under ice loads, the line will not become a traffic hazard.

The strain on the ties at the insulators is also considerably more than is normal on spans of average length. For this reason, it is generally considered desirable to make use of some type of armored tie to reinforce the line wire at the point of support on the insulator. The use of pre-formed armor rods or tie splints for this purpose is a desirable practice.

• • •

Q. We would appreciate it if you would please explain the use of equalizers in telephone circuits.

A. The attenuation of a telephone line is never the same at all frequencies and for this reason there is an ever present tendency towards distortion. The amount of distortion increases with an increase in the length of the line. Because of this action on long lines, it is frequently necessary to use a network to correct the unequal attenuation. Such a network is called an "attenuation equalizer," or simply an "equalizer."

Equalizers are networks that make use of inductors, capacitors, and resistors. As the frequency changes, the loss of the equalizer varies inversely with the line loss. Therefore, if the loss of the line is greater at high frequencies than at low frequencies, the loss of the equalizer used is greater at the low frequencies than it is at the high frequencies. Actually, the loss of the line plus the loss of the equalizer is substantially constant over the entire voice-frequency range.

• • •

Q. We would appreciate your explanation of the term "pair mile fill" as used in an exchange cable system.

A. The pair mile fill is a percentage which expresses the ratio of miles of cable pairs actually in use at a given time in a specific cable or group of cables to the total miles of cable pairs contained in the group under consideration. The pair mile fill provides a direct measure of the cable system performance and design; it indicates the degree of satisfaction with which the system is being utilized. This depends upon maximum fill, main frame fill, amount and direction of line growth, etc. Pair mile fill, therefore, presents a combined index of cable utilization.

Satisfactory pair mile fills can be maintained only by consistent attention to each phase of cable engineering and design. This consideration is necessary not only in the original system, but also in additions and/or extensions that may be made from time to time.

In a theoretically perfect aerial wire system, each circuit terminates at a customer's station at its greatest distance from the switchboard. Such a system—assuming all of its circuits are in use—would have 100 per cent pair mile fill. A cable system must, however, provide a considerable number of circuits in advance of actual requirements and the number of circuits can be reduced only at a comparatively few points along the route and not at each point where the capacity of any circuit is filled. For this reason, a cable system cannot economically have either 100 per cent of its circuits in use or 100 per cent of each circuit in use. An effort should be made, however, to operate a cable system at the greatest pair mile fill that is economically possible.

"Must be some mistake, miss. I'm working on the telephone lines."

• • •

Q. Will you please advise us what action can be taken to reduce the noise on a grounded rural line?

A. The only satisfactory method, in our opinion, is to string another wire and convert it to full metallic. With so many rural power lines now in service throughout the country, the grounded rural line is impossible in most localities.

If the present line wire is old and rusty and has numerous splices, there is also the probability that your best bet will be to string two new wires. In many cases, it is difficult, if not impossible, to balance one new wire with the old in such a way as to provide a quiet circuit over a metallic line.

• • •

Q. Please explain the cause of attenuation in a telephone line.

A. Because of the resistance, capacitance, inductance and leakage of a line, the total power transmitted into the line will not be received at the distant end. This energy loss is known as "attenuation." The attenuation of a line is never constant at all frequencies, and the higher the frequency the greater the attenuation.

Due to the fact that low frequencies are attenuated less than the higher frequencies, distortion occurs. This distortion is known as "frequency distortion." Frequency distortion may be corrected by the use of loading coils or equalizers, or a combination of both.

• • •

Q. We would like to know what is considered the greatest number of drop wires that should be extended into a single building?

A. This will depend somewhat upon local conditions, but, as a rule, four drop wires will be the maximum that will economically serve a single building. When a greater number of lines are required, a small cable will usually prove more economical.

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Repairing and Rebuilding Rural Telephone Plant

PART I

By F. E. BEHM
Lincoln, Nebraska

UNLESS JUST LATELY you have completed the job of repairing and rebuilding your rural plant, there is work to be done, if you expect to render the kind of service your patrons expect and the kind of service you would like them to have. However, before the actual work is started, plans must be prepared if you expect to do a thorough job and do it economically.

The first step in the preparation of plans is a map *(Fig. 1)* which shows the approximate location of each subscriber, telephone number, location of the pole line, number of wires in each mile of lead or fraction thereof, and location of each prospect.

You now have the basis for determining the number of metallic circuits needed to properly serve each area, by dividing the number of stations to be served, including the line prospects, by eight or nine as this is the maximum number of stations that should be served by each circuit on an average basis, and still expect satisfactory service.

The number of circuits may now be used to determine the length, class, and spacing of poles to be used.

Selection of Poles and Pole Fixtures—Pole Spacings

No. of Wires	Av. No. Poles per Mile	Span Length in Feet (1) Normal	Min.	Max.	Min. Pole Size Feet Length (2)	No. Class	Pole Fixtures No. of Brackets	No. of Crossarms 6-pin	8'6" 10-Pin (3)
Standard Construction—East and West Sections of Line									
2	25	210	168	231	16	9	2	—	—
4 to 6	25	210	168	231	16	9	—	1	—
8 to 10	25	210	168	231	16	8	—	—	1
12	25	210	168	231	20	8	2	—	1
14 to 20	36	146	117	160	20	8	—	—	2
22	36	146	117	160	20	6	2	—	2
24 to 30	40	132	106	145	20	5	—	—	3

If adequate clearance from trees or other obstructions cannot be obtained with the use of minimum length poles, the construction inspector should specify the proper length of poles to be used.

The cost of the taller poles should be weighed against the cost of permanent tree clearance by the use of the chemical 2,4,5-T.

Brush Eradication with Chemical Sprays

General. Certain herbicides have been found to be very effective in killing woody plants, such as trees and shrubs, without permanent damage to grasses and certain low growing weeds. There is little or no resprouting of the woody growths after treatment, such as would occur if the shrubs and trees were cut back.

These herbicides contain hormone types of chemicals (2,4-D and 2,4,5-T). It is thought that these chemicals kill the plants by causing them to change their carbohydrates (starch and cellulose) to sugar, thus using up their food supply. The plants thus literally starve to death within a few days after treatment.

Obtaining permission to spray brush growths—inspector's report. The importance of maintaining good public relations cannot be over-emphasized. Persons assigned to the spraying work must be sure that they have received permission from the proper authorities before starting spraying along private premises or public highways.

A special inspector's report is used for recording the work to be done and the authority granting permission to eradicate the brush along the right of way abutting his property. This re-

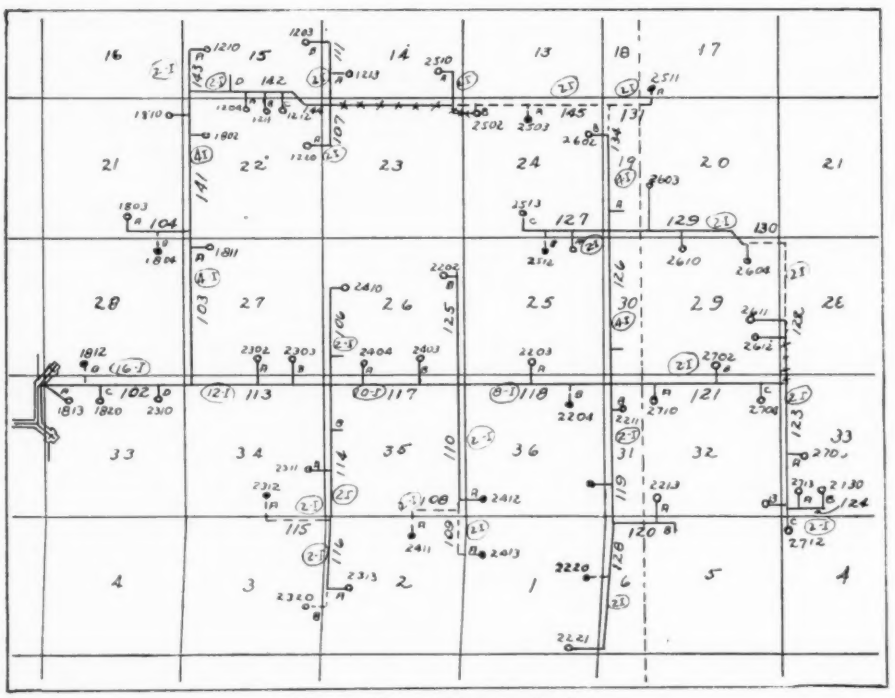

Fig. 1. Map showing circuit plan.

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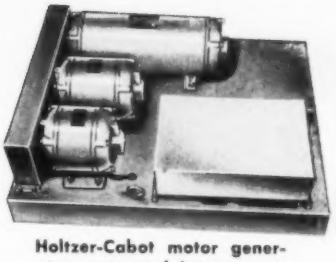
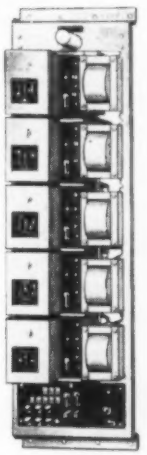
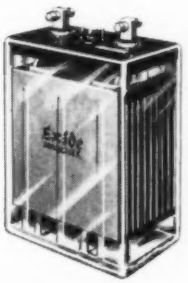


Holtzer-Cabot motor generator sets and interrupter machines for telephone exchanges.

Put power behind the R-RING via GraybaR



Leich converters for harmonic ringing.



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port should list the following information:

(a) *Exchange*—Name of exchange.
(b) *Inspector*—Name of person conducting inspection.
(c) *Mile Number* — Indicate mile number obtained from the rural plant record map for the exchange involved. Where several properties are in the same mile, indicate each portion by a letter suffix as A, B, C, etc.
(d) *Permission Granted By*—Enter the name of the property owner giving verbal permission. (Note: If a federal or state highway is involved, be sure that written permission has been obtained from the proper authorities for spraying along the highway.)

At the bottom of the form, under "Spraying Completed," the person completing the spraying work will indicate the date and sign his name in the proper spaces.

In addition to filling out the inspector's report, the inspector shall spot on the exchange plant record map the approximate locations of the brush to be treated, marking them as A, B, and C, etc., in line with the designations on the report.

Both the marked map and the inspector's report shall be turned over to the person assigned to the spraying work for his guidance. As the work shown on the inspector's report is completed, the report shall be signed by the person in charge and returned to the construction superintendent, or district office, as appropriate, for filing and future reference.

Spraying equipment. Power-actuated sprayers are provided for spraying woody growths. For successful spraying, it is essential to use a coarse-breaking spray. This is obtained by maintaining a pressure of 20 to 40 pounds at the pump and using the proper size of disc in the spray nozzle.

The manufacturer's instructions should be closely followed in the care and operation of power actuated sprayers.

Spraying method. Since the herbicide used in the spraying operations covered in the instruction is non-selective in its effect on woody plants, it will kill ornamental shrubbery, fruit trees, and certain crops. *For this reason, care should be taken not to let the drift from the spraying operation come in contact with such plants growing on private property abutting the right of way being sprayed.*

The spray mixture is applied to brush and vines at the base of the stems, starting at the ground line and going *up* for a maximum height of 6 inches all around the stem. The sprayer should be adjusted to produce a coarse-breaking (wet) spray, thus assuring that the bark is thoroughly wetted from the ground line up. Some of the liquid should seep down the bark at the ground line.

In spraying a hedge, time and trouble can be saved by going up one side of the hedge and down the other side to wet both sides of the brush stems. Sometimes poison ivy will survive, because the branches on one side seem to be nourished only by the roots on the same side, and, if enough bark area is missed, it will continue to grow.

When big trees are to be killed, the spray should be put on heavily enough so that the material will run to the ground line, or, more economically, the bark can be frilled out with an axe, and the mixture poured into the open frill.

In spraying stumps, douse the outside edge of the stumps with some of the liquid seeping into the ground around the stump. In addition, spray any exposed roots around the stump, as these may also sprout.

Tree clearance by trimming, as a rule, is not recommended unless the stumps are killed, as the trimming problem from second growth sprouts becomes more acute each two or three years. There are cases, however, where the poles may be moved out of line, or side trimming of large trees may provide permanent clearance.

Before starting the actual work, there are certain general instructions that should be considered:

Observe public regulations at all times.

Follow safe practices and conduct all work in such a way as to prevent accidents to the public, to yourself, and to other employes.

Before climbing a pole, test the pole, and if in doubt as to its soundness, brace it before you work on it.

Use care in climbing the pole and working aloft.

Be especially careful when working near electric light or power wires. Never forget that a cross between telephone and power lines may occur some distance away, and out of sight of men working on the line, making the wires dangerous to handle.

Treat all wires as dangerous, as if they are now in contact with power circuits, and avoid connecting yourself between the wires and ground, for example, through a down guy.

Avoid interfering with the traffic.

Park motor vehicles and locate your construction equipment and material in such a way as to obstruct traffic as little as possible. Where passing traffic is a hazard, protect the public and em-

This is the first of a series of articles on outside plant maintenance and construction to be written by Mr. Behm.

The author, who recently retired as general plant superintendent of Lincoln (Neb.) Telephone & Telegraph Co., has been in the telephone business since 1900 and is especially well qualified to cover this most important phase of telephone company operations.

His articles will be especially interesting and beneficial to the smaller Independent companies, all of which should make sure that their plant men receive future copies of TELEPHONY. Use the special offer subscription blank on page 54.

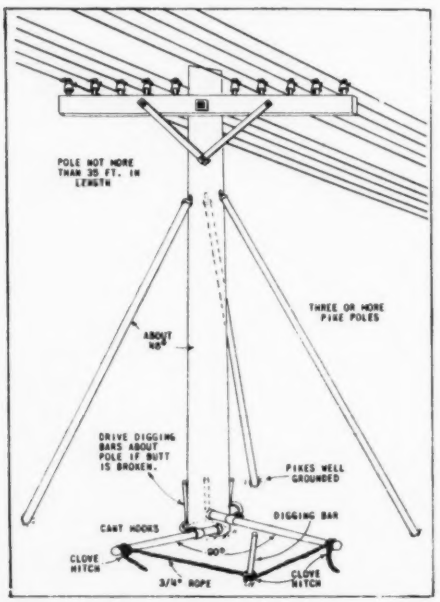

Fig. 2. Method of bracing unsafe pole with pike poles.

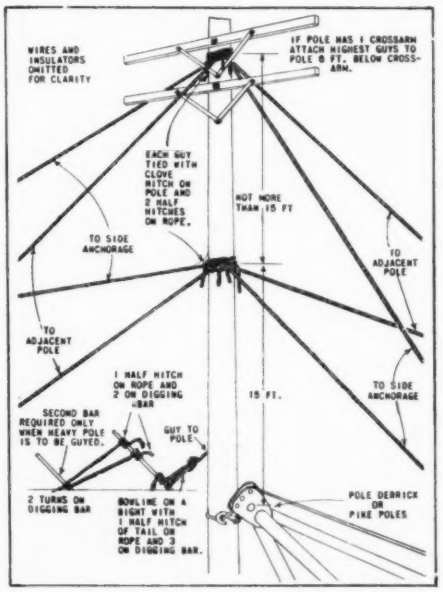
WIRES AND INSULATORS OMITTED FOR CLARITY
IF POLE HAS 1 CROSSARM ATTACH HIGHEST GUYS TO POLE 6 FT. BELOW CROSS-ARM.
EACH GUY TIED WITH CLOVE HITCH ON POLE AND 2 HALF HITCHES ON ROPE.
NOT MORE THAN 15 FT
TO SIDE ANCHORAGE
TO ADJACENT POLE
TO ADJACENT POLE
TO SIDE ANCHORAGE
1 HALF HITCH ON ROPE AND 2 ON DIGGING BAR
15 FT.
SECOND BAR REQUIRED ONLY WHEN HEAVY POLE IS TO BE GUYED.
GUY TO POLE
2 TURNS ON DIGGING BAR
BOWLINE ON A BIGHT WITH 1 HALF HITCH OF TAIL ON ROPE AND 3 ON DIGGING BAR.
POLE DERRICK OR PIKE POLES

Fig. 3. Use of rope guys to support unsafe pole. (Inset shows use of digging bars for anchoring a rope guy.)

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ployes with warning signals and guards.

Be careful not to damage the property of others. If damage does occur, visit with the owner and arrange to make suitable settlement as soon as possible.

On completion of the job, clean up and haul away all debris. Your aim should be to leave the premises in at least as good shape as when the work was started.

Make all your work of a permanent nature, unless the job is planned for a short period only. All work of a temporary nature should be made as inexpensive as practicable, but should be sufficiently stable to last for the full period of the temporary service.

Be sure that the work is done so as to provide proper clearance and provide safe working conditions. Do not let the excuse of a temporary job cause you to neglect your safety first rules.

Before we go any farther with our plans, it is important to review safety precautions in regard to the handling of poles.

Rural Line Construction and Maintenance

Safety precautions — testing poles, temporarily supporting unsafe poles, and working on them. Employes engaged in line maintenance and rebuilding work climb a great many poles in the course of their work. If a pole is unsound and its unsafe condition is not apparent to the man climbing it, a serious accident may result. This subsection prescribes methods of checking the condition of the poles before climbing them and procedures for temporarily supporting unsafe poles and working on them.

Before climbing the pole, examine your climbing equipment to make sure that your climbers, body belt, and safety strap are in *good working condition.* Follow instructions outlined in the Safety Code for safe climbing.

To avoid the possibility of injury, due to pole failure, observe the following precautions:

(a) Always make sure that the pole is strong enough to climb before you start going up on it. The pole may appear substantial from the ground, yet an unbalanced load near the top, such as that resulting from climbing, may be sufficient to break a partly decayed pole.

(b) An unsound pole may also break, if any attachments (line wires, drop wires, or guys) are placed, removed, or changed. For example, it may happen that a pole with a decayed butt is supported by line wires, a guy, and a drop wire span in such a manner as to appear to be quite substantial. If, however, the drop wire is cut, the resulting unbalanced pull of the line wires and the guy, combined with the weight of the man on the pole, will cause the pole to snap off at the base and fall.

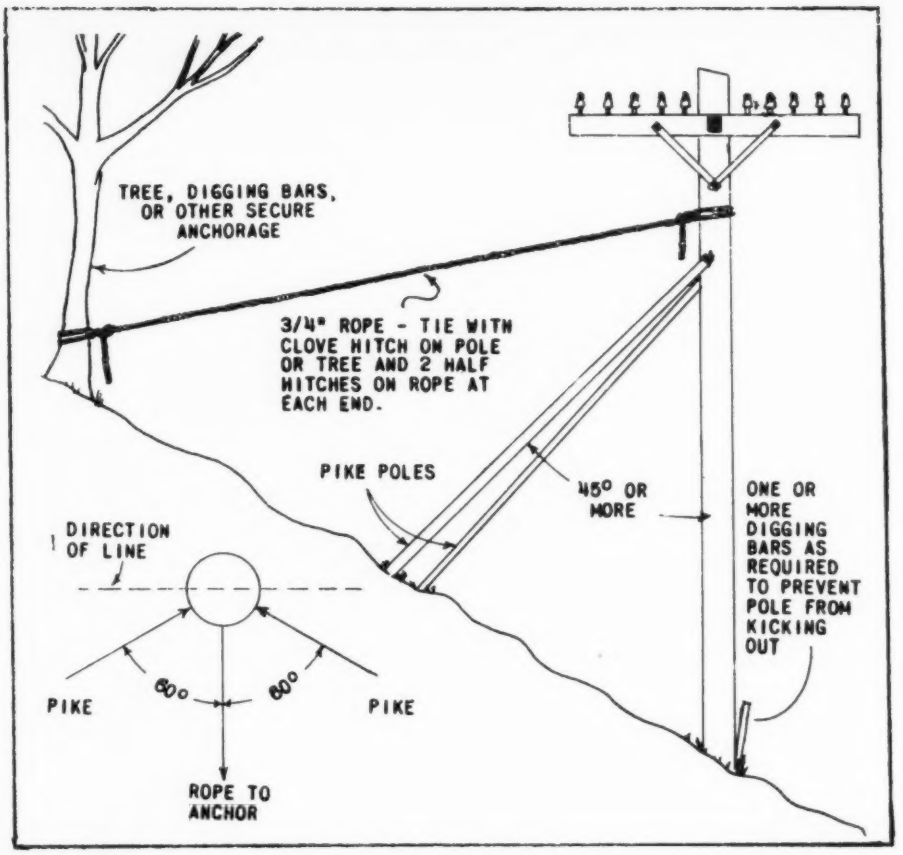
TREE, DIGGING BARS, OR OTHER SECURE ANCHORAGE
3/4" ROPE - TIE WITH CLOVE HITCH ON POLE OR TREE AND 2 HALF HITCHES ON ROPE AT EACH END.
PIKE POLES
45° OR MORE
ONE OR MORE DIGGING BARS AS REQUIRED TO PREVENT POLE FROM KICKING OUT
DIRECTION OF LINE
60°
60°
PIKE
PIKE
ROPE TO ANCHOR

Fig. 4. Method of supporting unsafe pole from one side of the line where other methods would be impracticable.

(c) If there is any question about the soundness of a pole and it is not practicable to test the pole as instructed in the following paragraph, always brace or guy the pole temporarily before climbing it, or removing pole attachments. In general, the condition of a butt-treated cedar pole more than 10 years old or a creosoted pine pole more than 15 years old may be regarded as questionable. There are, however, instances in which new poles have had the butt broken under the ground line, as the result of being struck by an automobile and superficially appear strong enough to be climbed; therefore, a pole which shows evidence of having been damaged in any way shall be tested and, if necessary, braced or guyed.

(d) A pole carrying wires having an excessive down pull or up pull shall be tested and, if necessary, braced or guyed.

(e) If a pole is being removed from service because of decay or damage, be sure to properly brace or guy the pole before removing the attachments. In the case of a row of poles requiring replacement because of extensive deterioration, provide the necessary supports on the poles on which men are working and on which unbalanced loads may be thrown by work on nearby poles.

(f) If there is any doubt about a pole not having been set to the proper depth, or if the earth has been removed from around the pole by road widening or grading operations, or by erosion, brace or guy the pole. Note: Many poles are marked with the supplier's brand located 10 feet from the bottom of the pole. This mark will be found helpful in determining the depth to which the pole is set.

(g) Climb the face or back of the pole, if practicable, to avoid placing side stress on the pole.

(h) In working on a pole of doubtful strength, do not swing about rapidly on the pole in your safety belt, even though the pole has been adequately supported.

The following instructions govern in testing poles for safe climbing:

(a) Whenever the condition of a pole is in any way questionable, it shall be given the pike pole test, unless:

(1) It carries one or more messengers securely clamped to the pole not more than 10 feet below the top and not having excessive down pull.

(2) It has 10 or more 104-gauge or larger wires tied in and not having excessive down pull.

(3) It is guyed by means of four-way storm guys.

(4) It is a jointly-used pole carrying power circuits.

(b) The pike pole test is made in the following manner:

(1) Place a pike pole against the pole, 8 to 12 feet above the ground, at right angles to the direction of the line, and, if practicable, at an angle or 45 degrees with the ground. (Note: Do not use a long-handled shovel or a tamp as a substitute for the pike pole.)

(2) Vigorously rock the pole back and forth with strong thrusts of the pike pole. While it is important for

(Please turn to page 64)

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Each Case of Cable Trouble Should Receive Special Study

By L. N. MARTIN

WHEN WE DISCUSSED the measuring of trouble results (TELEPHONY, Sept. 29, 1951, p. 16), we stated that it is difficult to find a suitable unit for measuring Cable Trouble. The Cable Pair Mileage would be hard to compute and would not be a suitable unit because a 200-pair cable does not have twice as much trouble as a 100-pair cable of the same length.

Some cable failures are total, but the typical case of cable trouble first affects one pair or a few pairs and, if cleared promptly, no further trouble is experienced. However, if it is neglected, the entire cable may fail. Therefore, we recommended that a separate study be made of Cable Trouble in which each location of trouble is counted as "one case" regardless of the number of pairs in trouble at that point. There can then be no doubt about the Mile of Sheath (or 100 miles of sheath) being a suitable unit.

Cable Trouble deserves a special study because in a modern exchange the cable and its terminals are the largest part of the outside plant. The only other item is drop wire. Cable Trouble differs from other trouble in that a trivial physical defect can cause an amount of trouble that is only limited by the number of working pairs in that part of the cable. This is another reason why it should receive special consideration.

The first step is to make a written report of each case. A small company having very few cases of cable trouble can make this report on blank paper, but for a larger company, or one having a large amount of cable, it is advisable to prepare a printed form called a "Cable Trouble Ticket." This is a "questionnaire" and helps the repairman to answer all the questions that should be answered on each case. It also serves as a record of the permanent repairs that will be required later, such as replacing a taped opening with a wiped sleeve or replacing a terminal which has been temporarily repaired.

Some of the information that should appear on the Cable Trouble Ticket includes: Date; cable number; location of trouble; size and count of cable at that point; class of trouble; cause of trouble; what was done to clear it, and what permanent repairs will be required. A serial number is assigned to each ticket and these numbers are recorded in the office to guard against the loss of a ticket.

PART 12. The preceding article in this series appeared in the Mar. 29 issue, p. 16.

At the end of each month or quarter, these tickets are posted to a form which is both a summary and an analysis (see TELEPHONY, Feb. 16, p. 19, for "Trouble Analysis"). *Table 1* is a suggested form which includes the best features of several forms examined. The classification is substantially that used by the Bell System.

The trouble is divided into two grand divisions "With Sheath Break" and "Without Sheath Break." The trouble with sheath break is divided into "Electrical," "External," and "Structural." And the trouble without sheath break is divided into "Conductor" and "Miscellaneous." Two other items, "Trouble Not Cleared" and "Trouble Disappeared" are found under "Miscellaneous Data."

It is suggested that this form be printed on paper 11x17 inches so that there will be room for plenty of columns. There should be separate columns for aerial, underground and buried cable and, since many new types

(Please turn to page 74)

EXCHANGE CABLE TROUBLE ANALYSIS

Exchange_____Month or Quarter_____

TROUBLE CLASSIFICATION			Cases	per 100 Miles	Cases	per 100 Miles	Cases	per 100 Miles	Cases	per 100 Mile
SHEATH BREAK	STRUCTURAL	Sleeve Joint								
		Seam								
		Patch								
		Taped Opening								
		Crack-Sleeve								
		Crack-Elsewhere								
		Cut by Support								
		Other Chafe								
		Other								
		TOTAL								
	EXTERNAL	Bullet								
		Bruise								
		Company Workman								
		Other Workman								
		Fire								
		Rodent & Insect								
		Ice & Frost								
		Manufacturing Defect								
		Other								
		TOTAL								
	ELEC-TRICAL	Corrosion								
		Lightning								
		Foreign Wire								
		Other								
		TOTAL								
	TOTAL-SHEATH BREAK									
NO SHEATH BREAK	CONDUCTOR	Insulation								
		Splicing								
		Lightning								
		Foreign Wire								
		Other								
		TOTAL								
	Miscellaneous-TOTAL									
	TOTAL-No Sheath Break									
GRAND TOTAL										
AUXILIARY DATA										
Terminal Replacement										
Terminal Repairs										
Temporary Taped Openings										
CABLE SHEATH MILES				X		X		X		X
Trouble Not Cleared										
Trouble Disappeared										

Table 1

Main telephone building Carlisle Exchange.

Exide-Manchex 11-FME-17 Battery in Carlisle Exchange of United Telephone Company of Pennsylvania.

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LOW DEPRECIATION: sturdy, long-life construction which includes the exclusive manchester positive plate.

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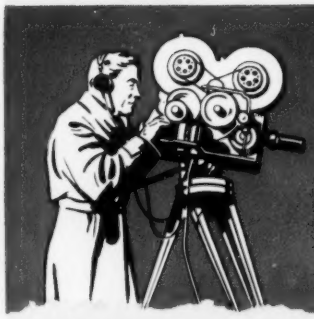

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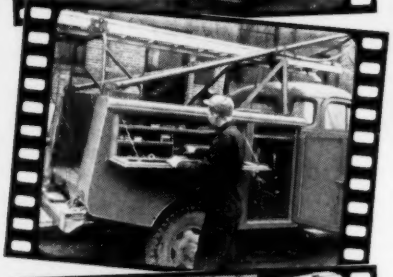

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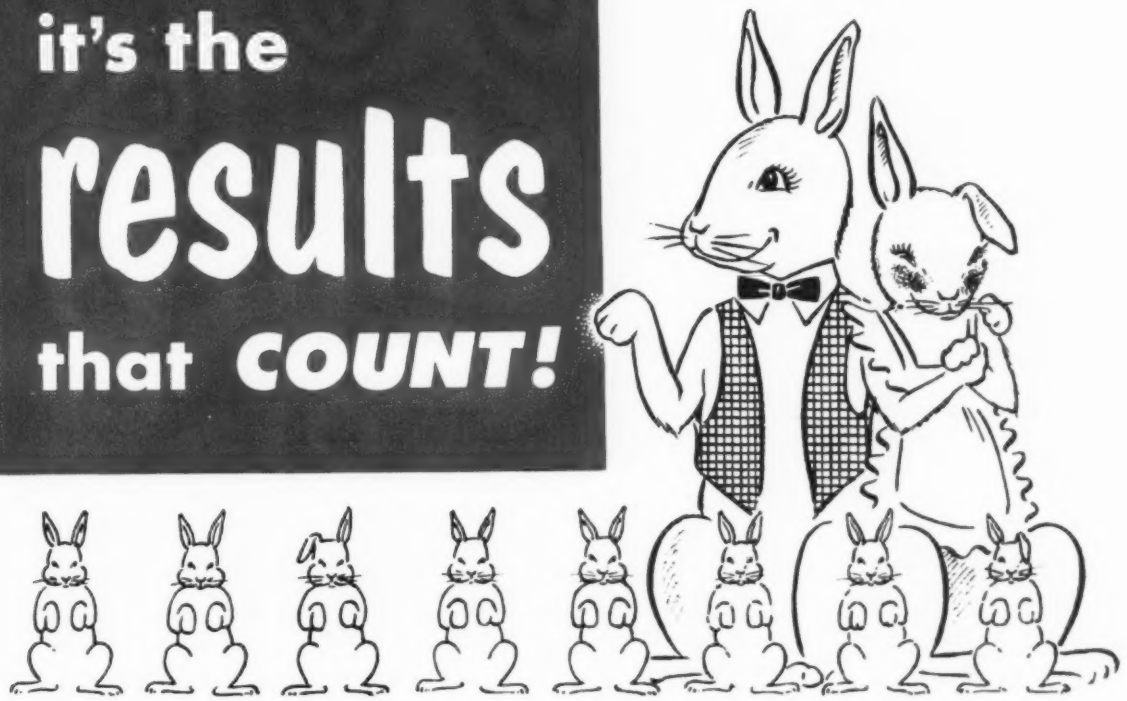

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Government Encroachment Threat

Jeopardizes Private Telephone Business, Iowa Independents Told

By R. C. RENO

THE UNPARALLELED progress of the private enterprise telephone system in this country is being jeopardized by government interference, controls and encroachment, Earle G. Bellamy, president of Iowa Independent Telephone Association, declared in opening the annual convention of that organization, held on Apr. 8 and 9 in Des Moines.

Bellamy also is president of Bellamy Telephone Co., Knoxville, Ia., and a director of the United States Independent Telephone Association.

"Under private enterprise, the telephone industry in this country, in spite of a relatively short life span, has given the American people the best telephone service in the world. But, today, as a result of increasing government controls and regulations, inadequate revenues, exhorbitant taxes and inflation, the industry finds it difficult, if not impossible, to continue its past record of meeting the service demands of the public," Bellamy said.

He observed that the growing trend of government to encroach upon private business and individual rights is the result of the increasing willingness of the American people, in general, to let the government supply their wants. He warned that, if our private enterprise system and individual freedoms are to survive, the people must put a stop to the present trend toward socialism and a powerful centralized federal government.

In an address on "Employe Morale is Important," George E. Brewer, Chicago, vice president, Telephone Services, Inc., told the convention that the life or death of any business establishment depends on the kind of employe morale it has. Good employe morale brings about many "blessings" which are essential to the success of a company, he said. Among those "blessings" he listed the following:

(1) Increased productivity.
(2) Improved public relations.
(3) Improved supervisory performance.
(4) Better relations with labor union leaders.
(5) Attraction of desirable people to the business.

Brewer then listed the essential factors for the development of good personnel relations and the resultant good employe morale as follows:

(1) Proper selection, placement and introduction to the job.
(2) Proper appreciation for work achievements.
(3) Proper respect for personal feelings.

(Please turn to page 48)

Officers and directors of the Iowa association included in this group are (left to right) RAY RIORDAN of LaCrosse, Wis.; C. C. PEARCE of Riceville, Iowa, newly elected president; ROSS VERNON of Sioux Center, Iowa, newly elected second vice president; EARLE BELLAMY of Knoxville, past president of the association; C. A. FARRINGTON of Centerville, Iowa; H. C. AMICK of Des Moines, Iowa; WILLIAM F. MILLER of Des Moines, re-elected secretary-treasurer; LOYD MORRISON of Grinnell, Iowa, and ROY BRANDELL of Mt. Pleasant, Iowa.

These two groups were photographed between sessions of the Iowa Independent Telephone Association.

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AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems
Makers of Telephone, Signaling and Communication Apparatus . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

TELEPHONE MESSAGES

for Farmers

People in rural America lean heavily on the telephone for both business and social purposes. The telephone industry has dedicated itself to filling their needs and is bringing them more and more telephone service. The Bell System alone is putting in about 1000 rural telephones every workday.

That job's important. And it's also important to keep farmers posted on the progress that's being made in rural telephone service. Telephone advertising does that, month after month. On the opposite page are some typical advertisements currently appearing in national farm publications.

ADVERTISEMENTS OF THE BELL TELEPHONE SYSTEM

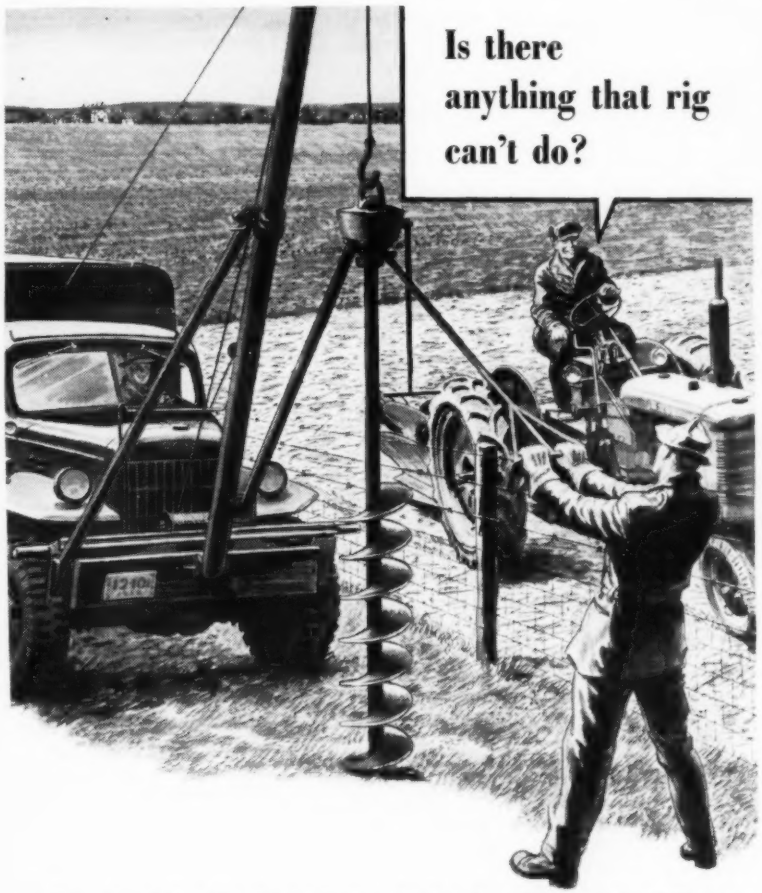
Behind him are 76 years of telephone experience

This telephone lineman carries to his job 76 years of experience—accumulated by Bell System people, day by day, since the telephone was invented. No wonder he knows his business.

In telephone work, as in farm work, experience counts for a great deal. And it generally adds up to newer, better, faster ways of doing things.

An important part of today's telephone job is the expansion and improvement of rural service. Since the war, experience has helped Bell System people add 1,850,000 telephones in rural areas. And we're keeping right on, at the rate of a thousand every workday.

BELL TELEPHONE SYSTEM



Is there anything that rig can't do?

Sure... lots of things. But when it comes to helping us put in rural telephone service, this rig is mighty hard to beat.

With its all-wheel drive we can haul equipment almost anywhere. We use its power take-off to dig pole holes, lift and place the poles, and roll up wire on its reels.

Using this fast two-man truck, Bell System construction men have planted thousands of new pole lines in rural areas. It's an example of Bell's constant search for easier ways to do things better, to give more and more people telephone service.

We are making full use of experience, skill and modern equipment as we add two rural telephones a minute, every workday in the week.

BELL TELEPHONE SYSTEM

"Going to be chilly on that telephone pole today"

Keeping telephone paths clear and service good in Bell rural areas is a year-round job. Often it means turning up coat collars and heading into the storm.

At times the storm is violent, with gale winds, road-blocking snow and ice, or rain for days, followed by floods. Then Bell telephone crews are alerted in all directions – often in several states. They speed to the crippled area with their special skills and tools. And Western Electric, our manufacturing unit with supply depots located all around the country, gets all kinds of needed telephone equipment on the scene fast. Soon, repaired telephone lines join in the all-out effort to set the community on its feet again.

In day-to-day telephone work and in emergencies, Bell telephone people have the training to do the job fast and well. That's why the best rural telephone service in the world is right here in America – and it gets better all the time.

BELL TELEPHONE SYSTEM

Try these tests...

CHECK its effective transmission—always clear and understandable, even when cut way down by losses on long lines!

SPIN the finger plate of the dial. You'll agree that such smoothness, such quiet, means "good-bye" to costly maintenance!

DIG at the inserts with a screwdriver. They're made of brass—and put in to stay! Parts won't work loose—even after years of service.

PULL at the hooksw*extra* tension that keeps maintenance-free.

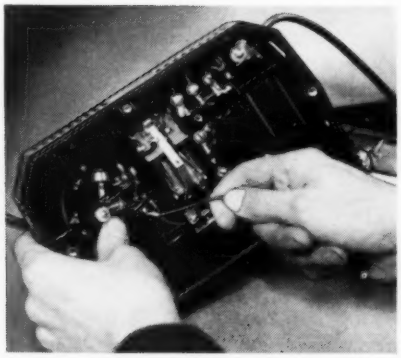
NEW LOW PRICES!

Type 40 with dial.....$24.15
Type 40 less dial.....$18.00

For Harmonic Ringing, Add 55 cents

(Above prices apply also to the Type 50 Wall Monophone)

hookswitch springs. Feel the
t keeps this switch practically



YANK on the wiring—*hard!* Every wire is soldered; no loose plug-in connections. Think of the trouble calls this saves you!

GRIP the baseplate; try to flex it. Made of thick, sturdy metal, it won't bend. Protects components from costly damage.

TAKE off the earcap and mouthpiece. Notice the smooth-working threads that signify fine manufacture—long-range economy for you!

...and you'll buy

AUTOMATIC'S

Type 40 Monophone

Why do we suggest you abuse a Monophone? Because we want you to *convince yourself* that buying Monophones can save you innumerable maintenance trips and a great deal of money. The telephones you buy may *have* to stand rough treatment—and *we* know Monophones can!

We *know*—because we've made these tests ourselves, and thousands of other tests, covering every detail of Monophone design and construction. TESTS show that every material used is the finest available for its specific application. TESTS keep our manufacturing processes efficient and extraordinarily accurate. And finally, constant TESTS by our vigilant Quality Control Department assure the maintenance of highest quality in day-to-day production!

Order a Type 40 Monophone today and test it yourself. Like thousands of other telephone men, you'll order many more later.
And remember: Monophones costs *less* now!

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems
Makers of Telephone, Signaling and Communication Apparatus . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

XUM

Low Cost Rural Lines with Surplus

ALL NEW MATERIAL

Crossarm braces, flat, galvanized

20"x$\frac{7}{32}$x1$\frac{7}{32}$ 10c
22"x$\frac{7}{32}$x1$\frac{7}{32}$ 12c
22"x1/4x1 1/4 ..... 15c
26"x1/4x1 1/4 ..... 20c

Machine bolts, galvanized

3/8"x4" 4c
1/2"x6" 6c
1/2"x7" 7c

Carriage bolts, galvanized

3/8"x4" 3c
3/8"x5 1/2" 4c

Lag screws, galvanized

3/8"x3 1/2" 2 1/2c
1/2"x3 1/2" 3 1/2c
1/2"x4 1/2" 4 1/2c

Angle thimbleye bolts

5/8"x10" 40c
5/8"x12" 42c
3/4"x14" 50c

Thimbleye bolts

3/4"x12" 47c

Angle thimbleye (washer)

Hubbard #1100—use under thru-bolt nut for down-guy. Fits up to 5/8 bolt—(50 per box) 15c

Strain plates, curved

4"x8"x1/8" 5c

Lift plates

for 5/8" bolt 15c
for 3/4" bolt 18c
for 1" bolt 20c

Washers, square, curved

2 1/2"x1/2"x$\frac{3}{16}$", for 5/8" bolt 4c

Eye nuts, with separate thimble

5/8" 20c

Clamps, guy

1 bolt ..... .10 3 bolt 6" std. .30
3 bolt 4" ..... .20 3 bolt 6" hvy. .35

Anchors, guy.

Cone, 6" $0.75
Chance exp. 8" 2 way 1.00
8" 4 way 1.50
Chance, screw type #6346, 6" screw, 5 1/2'x3/4", triple thimbleye rod (5 per bundle) ea. $1.50

Mathews ScrewLix, screw

Wrench type, 6" screw, 1/2"x5 3/4" rod equipped with thimbleye nut $1.00

Ground rods

5/8"x5' galv. with .104 copper tail $0.75
5/8"x6' galv. with .104 copper tail .80
1/2"x6' Copperweld, .080 copper tail 1.00
3/4"x8' Copperweld, no tail 2.00

IN 56

5c each— Worth 25c

Signal Corps IN 56 (all-purpose)

Porcelain, brown, glazed

Drop may be tied to lower groove. Use with 2 x 4 or improvised crossarm or in place of wood bracket and insulator. Insulator size: 2$\frac{5}{16}$" high, 1 1/2" diam. 3/8" x 4" galv. steel screw set in lead. Thread length 2", 1" flattened section at top to permit turning in with monkey or crescent wrench. Ample "dry spot" area.

Ideal quick repair for broken wood pin. 80 or 100 per box.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

No. 9 Pony

2c

glazed porcelain, brown 3" high x 2" diam. 100 per case

IN 25

Packed in light-weight partitioned case. Weight, either type, 70 lbs. per hundred

DROP WIRE

#14 ga. HD copper, tw. pr., rub. ins. wp braid 500 ft. coil ..... $27.50 M
#17 ga. HD copper, parallel, plastic, 2500 ft. reels ..... 17.50 M
#17 ga. Copperweld, parallel, rub. ins. wp. braid, 1000 ft. coils ..... 18.50 M
#18 ga. bridle, copper, rub. ins. wp. braid 1000 ft. coils ..... 15.00 M
#17 ga. copper, parallel, direct burial type soft synthetic rubber covered. May also be used under water or for short drops. 2500 ft. reels ..... 10.00 M
Army field type W110B, tw. pr. (3 copper & 4 steel strands each conductor) rub. ins. wp braid. OK for temporary cabling or emergency lines & drops, per mile 10.00
Multiple drop- 5 pr. # 19 ga. coded, Neoprene covered, 1/2" diam. 100 ft. coils only 5c ft.
Aluminum alloy armored. 3 pr. #22 ga. enamel tough rubber jacket under basket-weave armor. 2500 ft. reels, full reel ..... 6c ft.
Less than full reel ..... 7c ft.

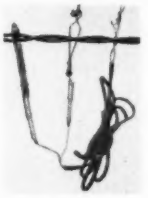
Lineman equipment, all new

Lag wrench, Bell type, two sized openings each end (3/8" to 3/4" nuts) with hole for turning in pole steps, etc. $1.00
Safety straps, adj. web (fabric) Army type 2.00
Belts, 20" & 28" (between D rings) only 2.00
Strap & belt 3.75
Climbers, Klein 1901 type with leather straps and pads, size 15, 15 1/2 & 16 only 5.00

Test Leads

CD 190, army type

2 conductor rubber ins. braid cord with bronze spring clips. Replaceable needle points (5) penetrate insulation. Per pair ... $1.00



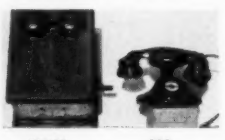
CD 190

Ringer Boxes

W.E. #300N, 5 bar, 2500 ohm natural oak finish. As removed from service. Guaranteed working order. f.o.b. Los Angeles or Pennsylvania ..... $ 6.00
Completely rebuilt & refinished 10.00
Brand new, natural oak finish 12.50
Brand new, painted (army olive drab) 10.00
Sl. used painted (army olive drab) 7.50
Good used, reconditioned 5.00

Western Electric

Telephones



300N 202

W.E. #202 desk set. E-1 handset converted to take F-1 transmitter capsule (LB or CB), blanked for dial ..... $ 7.50
With met. dial 11.00
Kellogg #5812M wall handset. Oak box, painted (army olive drab) 5 bar, 1600 ohm.
New $17.50
Reconditioned 15.00

Battery Boxes

3 cell, metal, fiber lined, flat black finish $1.00

Write for quotation on any other telephone material or equipment. We have thousands of other items in too small quantities to advertise.

THE Telectric CO.

1218 VENICE BOULEVARD
LOS ANGELES 6, CALIF.
RIchmond 2249

Priced f.o.b. Los Angeles, Calif. Limited stock but nothing reserved. Shipped on 30 day open account with return privilege if not satisfied.

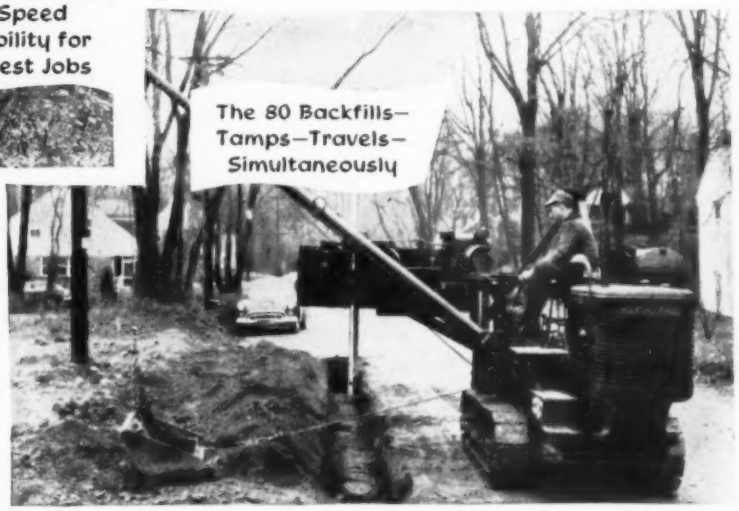
YOU *Do More* WITH CLEVELANDS

more trench . . . in more places . . . at less cost . . .

CLEVELANDS' wide range of speed *combinations,* their wide variety of trench sizes and their famous dependability assure you *more trench.*

Compact, correctly balanced, full crawler maneuverability and lower ground bearing pressure permit working in close quarters, in all soils and terrain — assure fast easy loading for quick jumps by truck and trailer — for work *in more places.*

Correctly designed, built of finer, tougher materials CLEVELANDS conserve fuel and stay running longer *at less cost.*



— CLEVELAND MODEL 80 →

Backfiller • Tamper • Side Crane • Safely Permits Immediate Repaving • One-Man Operated • Saves Time, Work and Money on all Trench Completion Jobs

Manufacturing also Penote Sectional Steel Manhole Forms, Concrete Inserts and Bolts for Cable Racks

THE CLEVELAND TRENCHER CO., 20100 St. Clair Ave., CLEVELAND 17, OHIO

XUM

(4) Fair and impartial treatment in all matters.

(5) Considerate, constructive discipline and correction.

(6) Pride in work and company.

(7) Satisfaction in working together as a social group and friendly work atmosphere.

An increase in the telephone company membership of the association from 188 to 273 since 1946 was reported by Secretary-Treasurer William F. Miller in his annual report. Miller became secretary of the association in 1946.

He also reported that the association had held 30 district meetings during the past three years with an average attendance of over 100 per meeting.

In pointing out other activities of the association during the past year, Miller told of the work of the association Small Company Committees in assisting the smaller units in Iowa; preparation of a "Directory Advertising Manual" to assist small companies in increasing their directory revenues, and the preparation of a model tariff for use by Independent companies.

Warren Clay, Hutchinson, Minn., director of the United States Independent Telephone Association, represented the national association. He praised the Iowa association for its activities in behalf of the smaller telephone companies in the state, stating that its "small company assistance program" is a model which is being followed or considered by many other state associations.

He commented upon the activities of the USITA and urged all state associations to support and cooperate with the national organization.

C. C. Pearce, Riceville, vice president of the Iowa association, and a member of the USITA Advertising Committee, introduced Phil Rouda, of the Telephone Advertising Institute, which prepares advertising material for Independent telephone companies. The latter explained the institute's program and urged Iowa Independents to consider subscribing to its services.

The afternoon of Apr. 6 was devoted to plant and traffic conferences.

The plant conference was conducted by John G. Reynolds, managing editor of Telephone Engineer. In opening the conference, he cited several new innovations and experiments in plant construction and urged all companies to consider putting new ideas and methods to work in expanding their plants to meet the unprecedented demand for telephone service.

B. C. Burden, Lincoln, Neb., consulting engineer, spoke on "Capabilities and Limitations of Carrier Equipment," in which he described the various types of carrier systems and their applications in Independent telephony.

He pointed out that carrier systems are usually installed for one of the following reasons:

(1) To provide needed channel capacity on existing wire leads either for reasons of economy or where it is impractical to add additional wire channels.

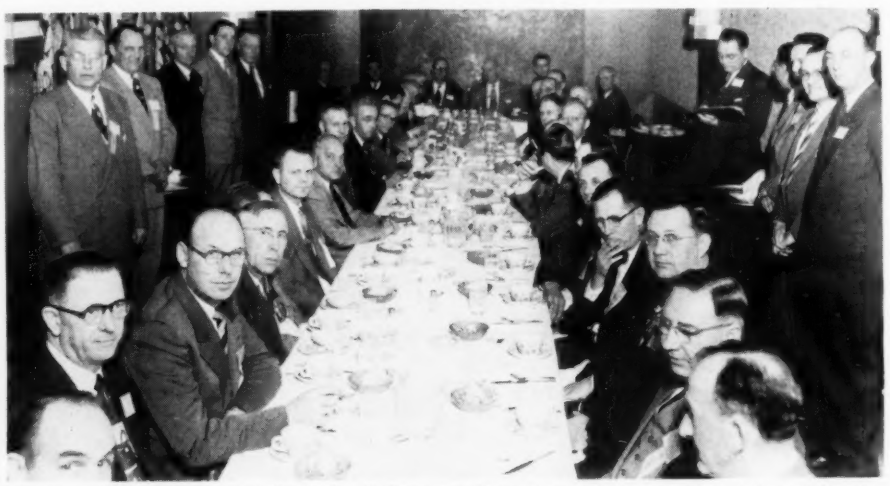
(2) To provide emergency toll or local service into specific areas because of disaster, abnormal growth, seasonal requirements or other unusual conditions.

"In the past, carrier systems have been used primarily for toll circuits. In the last year or so, however, there

(Please turn to page 52)

This foursome, photographed at the Iowa convention, includes (left to right) CLYDE McFARLIN of Montezuma, Ia.; W. F. MILLER, Iowa association secretary; EARLE G. BELLAMY of Knoxville, Ia., immediate past president of the association, and J. M. ROBERTS of Gallatin, Mo.

Inspecting the exhibit of the Telephone Advertising Institute are (left to right) R. C. RENO, TELEPHONY's editor; RAY J. RIORDAN of LaCrosse, Wis.; PHIL ROUDA of the institute, and VERNE B. CLARK of Lincoln, Neb.



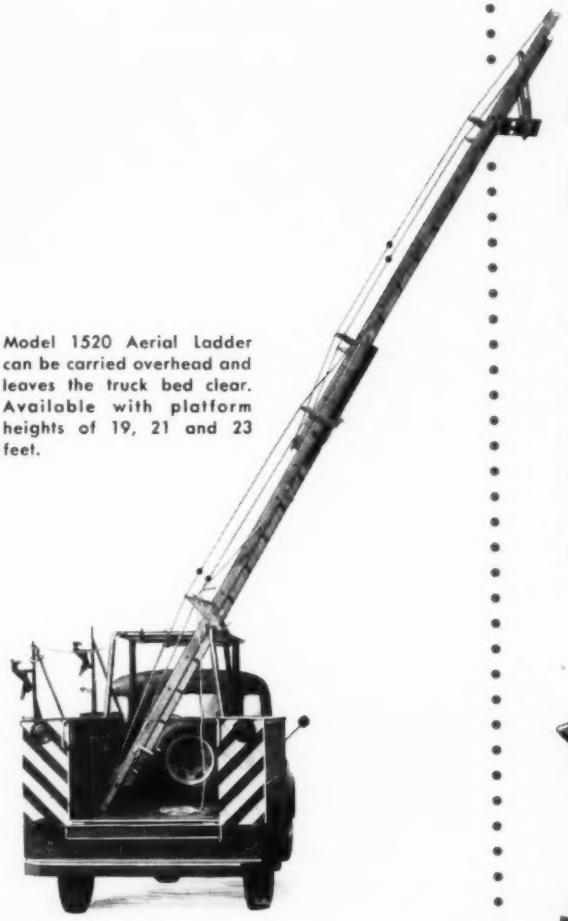
Members of the Iowa association's Small Company Committees held a special meeting during the Iowa convention.

This Mark HOLAN

identifies the most efficient Utility Bodies you can use

The yearly savings, made possible by well designed utility bodies, is becoming more and more apparent to utility executives. That is why men in the industry are so enthusiastic about the many advanced features developed by Holan engineers.

Holan utility bodies can help you solve the problem of rising costs versus controlled rates. There is a complete line of Holan bodies for construction, maintenance and service work.



Model 1520 Aerial Ladder can be carried overhead and leaves the truck bed clear. Available with platform heights of 19, 21 and 23 feet.

Model CLC-138 Line Body with four man crew compartment. Many standard line body models are available, with or without crew compartments.

Model CS-90 Cable Splicer and Maintenance Body. Compartments carry furnace, solder pot, cylinders, tent carriers, platforms, testing equipment, rubber goods, wire, tools and small parts.

The dependable name in utility bodies

J. H. HOLAN CORPORATION

BODIES AND ACCESSORIES FOR UTILITIES
4100 West 150th Street — Cleveland 11, Ohio

DISTRICT SALES REPRESENTATIVES

2754 N. 92nd Street
Milwaukee 10, Wis.

6-03 161st Street
Beechhurst, Queens, N. Y.

DISTRIBUTORS

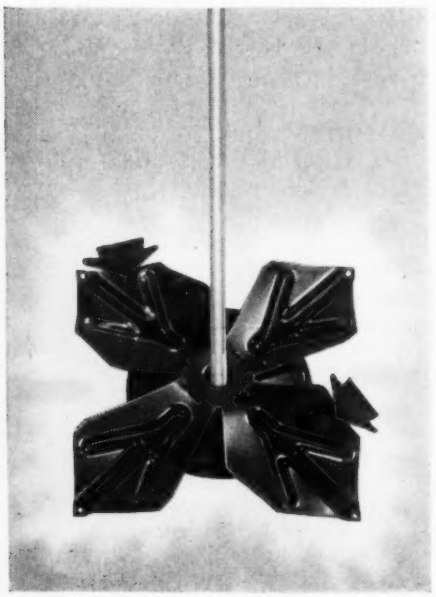
Baker Equipment Engineering Co.
Summit and Norfolk Sts., Richmond, Va.

Baker Equipment Engineering Co.
2401 Hutchinson Ave., Charlotte, N. C.

Schetky Equipment Corp.
1810 S. E. 10th Ave., Portland 14, Ore.

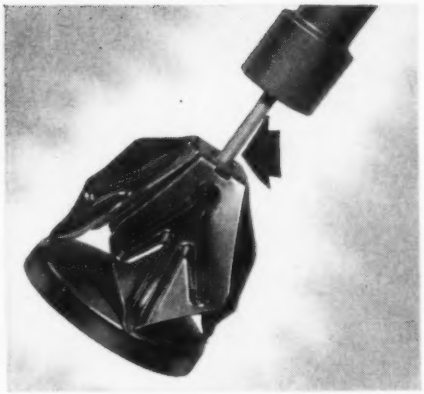
XUM

Two-piece design . . . The four blades are formed of a single piece of steel, and are held to the base plate by four small bolts, which simply shear off by tamping. The center hole is extruded downwards. This extrusion provides a bearing surface against the rod to prevent binding; it reinforces the tamping area; and it provides an audible signal when the extrusion strikes the base, indicating full expansion.

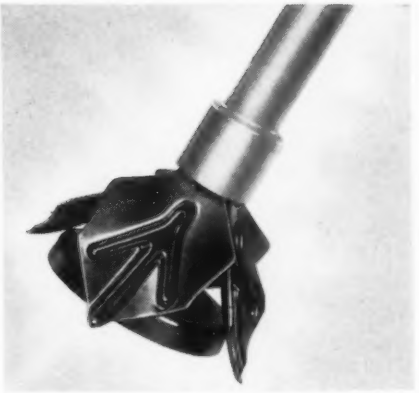


Top view . . . Notice the additional area inside the center of gravity of two opposed blades which gives utmost area for increased holding power, without sacrificing balance of the anchor.

Base plate . . . .Heavy steel, with skirted edge to prevent deformation. A nut retainer strap welded to the underside reinforces the hole so that the nut cannot pull through the base plate.



Anchor closed . . . Notice the large square tamping area, and the wide hinge sections which keep the blades from twisting if a stone is encountered while the anchor is being expanded.



Partly open . . . Arched, shovel-shaped blades slide into the earth with a minimum of soil disturbance. Heavy ribs on the underside decrease friction between blades and base plate.

Fully expanded . . . A large percentage of the expanded area is in undisturbed earth. Therefore load can be applied to the anchor immediately after installation, with little danger of creepage.

L-M's New 4-Way Pressed Steel Anchors Designed for Exceptional Strength

L-M has recently completed an extensive series of tests that reveal exceptional strength and holding power in the new 4-Way anchors.

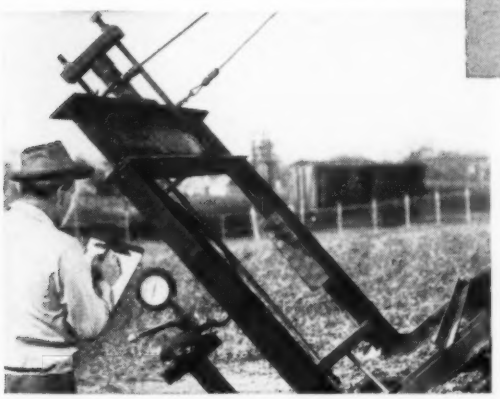
These anchors are easy to install. They have ample holding power above their nominal ratings. There is a generous safety factor in mechanical strength of all parts. And the cost is low!

The design offers many desirable features. A large square tamping area is well reinforced by the downward extrusion of the anchor rod hole, which also provides a bearing area against the rod. Arched, pointed blades slide into the earth without disturbing it, permitting application of the load right after installation. Heavy ribs reinforce the blades and reduce friction against the base plate during expansion. Nut retainer strap reinforces the base, and keeps the nut from pulling through. All three sizes are REA-accepted.

For information ask your Kellogg man; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

Available in Three Sizes

Catalog No.	200026B1	200026B2	200026B3
Expanded Area, square inches	110	125	132
Nominal Holding Power Class, pounds	6000	8000	10,000
Diameter, closed, inches	8	8	8
Anchor Rod Diameter, inches	⅝, ¾	⅝, ¾	1
Minimum Strength of anchor without deformation, pounds	16,000	21,000	24,000



Hydraulic lift mounted on U-shaped steel frame with pump and pressure gauge for recording the pounds of pull applied to anchor rod. Tests at vertical and 45° angle showed ample mechanical strength of all parts, well balanced against holding power.

81-R

LINE MATERIAL

Line Construction Materials

Sold for L-M to the independent telephone industry by

KELLOGG

SWITCHBOARD AND SUPPLY COMPANY

6650 South Cicero Avenue, Chicago 38, Illinois

XUM

has been an increasing trend toward the use of carrier channels for free service trunks between adjacent exchanges, and for short haul toll on iron wire. Consideration is even being given to the use of carrier to provide extra circuits in rural areas where cost and other advantages can be shown over the use of additional wire.

"The increasing popularity of carrier systems in Independent plants has resulted largely from the very nominally priced compact carrier systems now available. A comparison of the streamlined, modern, single channel, low-maintenance cost system with the single channel system of 20 years ago illustrates the tremendous progress that has been made," Burden said.

"One need not be an electronics technician or a graduate engineer to understand, install and maintain carrier equipment. Carrier units are actually no more complicated than are switchboards and telephones," Burden pointed out.

Charles Laverty, Indianola, Ia., of Laverty Chemical Co., explained the use of chemicals to eradicate and control brush along rights-of-way. He discussed the various herbicides on the market and the proper methods to fol-

Iowa Pioneers Sponsor Convention Luncheon

One of the features of the convention of Iowa Independent Telephone Association was the luncheon meeting on Apr. 8, which was sponsored by the Tom Griffith Chapter of the Independent Telephone Pioneer Association.

L. F. Morrison, Grinnell, president of the chapter, presided over the meeting and Clyde McFarlin, Montezuma, was toastmaster. C. Marshall Fischer, world traveler and humorist, addressed the meeting.

Following the luncheon, the following directors of the chapter were elected: C. L. Durschmidt of Fort Dodge; Carleton Haven of Rockwell City; L. F. Morrison of Grinnell; James F. Searl of Newton; Russell E. Shostrom of Dayton; Norman N. Sillett of Brooklyn; Mrs. Loretta Stoneburner of Creston; Merle R. Thompson of Toledo, and Guy Francis of Bondurant.

The directors elected the following chapter officers: Mr. Morrison, president; Mr. Thompson, vice president, and Mrs. Ruth Miller of Des Moines, secretary.

LOWELL

IS A LEADING MANUFACTURER

Lowell Manufactures Top Quality Telephone Wire from the finest materials available.

Neoprene Jacketed Drop Wire for the toughest assignments and best performance.

Tank tested, carton packaged, and completely inspected for highest standards of compression, adhesion, insulation and abrasion to guarantee wire with maximum lasting qualities.

Write us today for samples, prices and specifications and technical data.

Marker Threads in color indicate Year of Manufacture and facilitate "length of service" records.

•

LOWELL

- **NEOPRENE**
  JACKETED AND RUBBER INSULATED
- **DROP WIRE**
  WITH BRONZE, COPPERWELD OR COPPER CONDUCTORS, BRASS FLASHED OR TINNED

All Lowell Telephone Wire is thoroughly tested for physical and electrical characteristics in completely equipped, modern laboratory and inspection departments, and manufactured under rigid quality control.

A complete line of Insulated Telephone Wire—outside or inside.

Distributed by THE TELEPHONE REPAIR & SUPPLY COMPANY, 1760 Lunt Avenue, Chicago 26, Illinois
Regional Distributor JACK PRUZAN CO., 109 Jackson Street, Seattle 4, Wash.

• • • LOWELL

INSULATED WIRE DIVISION

The Overlakes Corporation • LOWELL, MASSACHUSETTS

XUM

SPECIAL 10—MONTH SUBSCRIPTION OFFER FOR TELEPHONY

Send in Coupon Below

TELEPHONY Pub. Corp.
608 S. Dearborn St.
Chicago 5, Illinois

Enclosed find $2.00 for 10-month subscription to TELEPHONY for the following:

TEL. CO._____ **TEL. CO.**_____

NAME_____ **NAME**_____

ADDRESS_____ **ADDRESS**_____

low in using them. Laverty, whose firm contracts with utilities for the chemical control of brush, also explained the cost of clearing rights-of-way under this method.

The traffic conference was presided over by C. C. Pearce, Riceville.

A toll dialing demonstration was presented by E. W. Murphy, Des Moines, traffic results supervisor, Northwestern Bell Telephone Co.

Murphy also was moderator of a "traffic service clinic" with the following as panel members:

Mrs. Mildred Cessna, traffic supervisor, Iowa Continental Telephone Co., and Iowa Telephone & Telegraph Co., Grinnell.

Margaret Evans, area traffic instructor, Northwestern Bell Telephone Co., Des Moines.

Betty June Heifner, chief operator, Iowa State Telephone Co., Newton.

Mrs. Lemah Howard, chief operator, Farmers Mutual Telephone Co., Clarinda.

Mrs. Elsie Lillibridge, chief operator, Central Iowa Telephone Co., Manchester.

Eva Nicoletto, methods and practices supervisor, Northwestern Bell Telephone Co., Des Moines.

The editor of TELEPHONY addressed the convention on "A Lesson from an Old Primer," in which he analyzed the principles and objectives of socialism as promulgated by Karl Marx in the "Communist Manifesto." He then presented the 10 steps to communize or socialize a nation, as laid down by Marx in the Manifesto, and summarized the government trends and legislation in this country during the past two decades under each of these 10 points, asking his listeners to decide for themselves whether or not any similarity exists between what Marx recommended and what has taken place in the United States.

Clyde McFarlin, president of Montezuma (Ia.) Mutual Telephone Co., and counsel for the Iowa association, spoke on "Probable Effects of State Utility Regulation." He discussed state regulation of utilities in general and described the provisions of the proposed public utility regulation bill which is pending before the Iowa legislature.

"Commercial Bank Financing for Telephone Companies" was the subject of an address by Thomas W. McMahon, Jr., New York City, assistant cashier of the Chase National Bank, which offers Independent companies short-term construction loans to finance conversion and expansion programs.

In his opening remarks, he pointed out that the characteristics of the utility industry — high ratio of plant investment to total revenues and regulation of earnings—are such that utility companies must obtain funds from outside sources for any expansion beyond very nominal growth. Further, because of this same regulation of earnings, the ultimate financing must be of either a permanent or long term character. It is manifest that the same income dollar

(Please turn to page 70)

These Notes were placed privately with institutions for investment through the undersigned. They are not offered for sale and this announcement appears as a matter of record only.

$750,000

North State Telephone Company

3.55% Sinking Fund Notes

Due April 1, 1977

Kidder, Peabody & Co.

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AMCREO LOWRY PROCESS CREOSOTED WOOD

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GENERAL SALES OFFICE — CHICAGO, ILLINOIS

Pressure treated for strength that lasts

XUM

Courts and Commissions

Hay Springs (Neb.) Company Gets First Increase Since 1935

Hay Springs Telephone Co., operating 578 stations in western Nebraska, has been authorized by Nebraska Railway Commission to increase rates on all classes of service.

The approved schedule raises business metallic rates from $3.25 to $4.50, and grounded from $2.75 to $3.25; individual residence, metallic, from $2.25 to $3.25, and grounded from $1.85 to $2.50; residence, two-party metallic, from $2.00 to $3.00, and grounded from $1.60 to $2.25; rural metallic, from $1.00 to $1.50, and switching from 50 cents to 75 cents.

The company has not had a rate increase since 1935, and last year operated at a loss of $1,660. Revenues for 1951 were $14,910, and under the new schedule will rise to $19,090. Increases in operating expenses and taxes will bring a total of $18,625. The property has an appraised value of $27,625.

V V

Announce Merger of Two Kentucky Independents

Ashland (Ky.) Home Telephone Co. has been merged with Kentucky Telephone Corp., Lexington, effective on Apr. 1.

Prior to this date, the two companies, both subsidiaries of General Telephone Corp., were operated as separate corporations. With the merger, the two companies will be operated as a single unit.

Kentucky Telephone Corp. now operates 23 exchanges with approximately 57,000 telephones, serving more than 150 communities and cities in Kentucky.

Officers of the corporation are Harry J. Huether, president; Bernard LeBaron, vice president; D. H. Lloyd, secretary-treasurer, and Ernest F. Mercer, general auditor.

V V

Minnesota Commission Approves Sale of Five Independents

Approval of the sale of five Minnesota Independents was granted on Apr. 7 by Minnesota Railroad & Warehouse Commission.

Crow Wing Cooperative Rural Telephone Co. bought four of the companies: Clearwater and Nokay Lake Rural Telephone Co.; Freedham Rural Telephone Co., which operates in Ripley, Platte and Belle Prairie; Mission Township Fire Protection Telephone Co., and Motley Telephone Exchange.

The fifth Independent sold was the Sebeka and Menahga exchanges of the Hohman Telephone Co., Pelican Rapids, to the West Central Telephone Association.

V V

Increases Recommended for Oklahoma Independent

Increased rates amounting to about $2,040 annually were recommended for the Canute (Okla.) Telephone Co. by Paul R. Reed, public utilities commissioner, following a hearing on Apr. 17.

New rates recommended, subject to final approval by the corporation commission, are:

	Proposed Rates
One-party business, wall	$3.50
One-party residence, wall	2.00
Rural residence, multi-party	1.75
Rural switched	.75
Differential for desk	.25

V V

N. C. Independent Plans $125,000 Expansion

The Morris Telephone Co., Roxboro, asked the North Carolina Utilities Commission on Apr. 7 for permission to borrow $125,000 to permit it to carry out an expansion program.

The company said it wants to expand central office facilities in Roxboro and Yanceyville and to build rural lines from Roxboro, Yanceyville and Hillsboro.

V V

Rules Company May Stop Service Upon Police Investigation

Connecticut Public Utilities Commission ruled on Apr. 15 that a telephone company may terminate service to an individual subscriber when advised by a bona fide law enforcement agency that the individual is using the service illegally.

The state regulatory agency further held that arrest and conviction are not necessary to give the telephone company sufficient right to terminate the service.

The commission specifically denied a petition of Alexander Presmarita of Hartford to have telephone service restored at Al's Cigar Store, Hartford. Presmarita complained that the company had acted arbitrarily in removing the telephone service and declared that

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guy and messenger galvanized strand

The superior tensile properties inherent in steel are used to full advantage in *Crapo* Galvanized Strand. The tightly adherent zinc coating applied by the *Crapo* Galvanizing Process provides lasting protection against corrosion, and prolongs the life of the strand. Controlled ductility makes *Crapo* Strand easy to work and to serve. Low first cost and low yearly cost result in important economies for operating companies.

The all-round dependability of *Crapo* Galvanized Steel Strand is being demonstrated constantly by its outstanding performance in service. There is a size and grade for all practical needs.

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. . . are designed to meet the most rigid anchoring and guying specifications.

The patented EVERSTICK Nut Housing locks anchor firmly on rod, making installation simple under all conditions and permitting easy recovery of the rod. Note well-designed, heavily constructed sections of metal in base plate.

EVERSTICK Expanding Plates are *ribbed* to double their original strength; their cutting edge and wedge shape arm socket reduces earth resistance to a minimum and assures easy expansion.

Three-Way EVERSTICK with expanding plates—contacts solid earth at every point around base plate, giving full benefit of earth's holding power.

Spreader Arms extra heavy ribbed with ball and socket joint at top and clinched socket on expanding plates allow heavy bearings to move freely with minimum friction, insuring easy expansion which eliminates buckling or breaking of arms.

EVERSTICK Anchor

. . . the anchor of merit

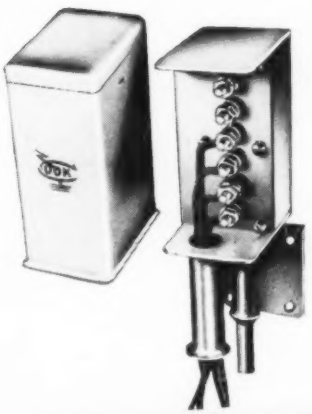
for shorter drops . . . less bracket lines

cook 3-pair XB terminal

An addition to the well-known XB family of unprotected terminals, this development provides far better, more economical means of subscriber distribution out of rural cable.

The 3-pair XB Terminal was especially designed to reduce to a minimum all factors that would cause high resistance and the possibility of line leakage and maintenance. Hence the heavy, close-fitting welded zinc cover; the noncorrosive Monel faceplate on which are mounted the highly insulated cable studs; the use of the flanged tube as an entrance for drop wires. This tube can be completely sealed after the drop wires are installed.

The new Cook Terminal measures 7½" high, 3¾" deep and 2½" wide. It is furnished with or without cable stub, to user's specification.



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ADD UP THESE ASSETS — *Raytheon RectiChargeRs are fully automatic in operation . . . always follow the load . . . maintain constant voltage output over the complete load range . . . prolong battery life . . . prevent overcharging and undercharging . . . contain no moving parts to wear out . . . require no routine maintenance other than inspection only once or twice a year* — and you have the standard, time-tested battery charger of the constant potential type, the ideal equipment for year in, year out dependable Telephone service at low cost.

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Catalog Number	Battery Cells	Amps. Cont.	Input Voltage	Control
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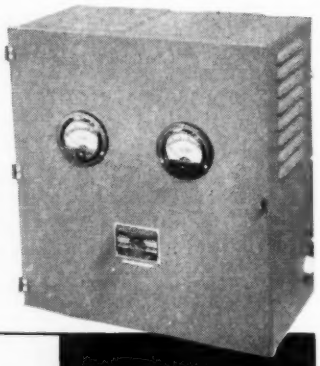
RCR-2013A RCR-2016A	11, 12 11, 12	12.0 24.0	115 or 230 volts, 50 or 60 cycles, 1-phase	Electronic
RCR-1068B RCR-1069D RCR-1070D	22, 24 22, 24 22, 24	1.0 3.0 6.0	115 volts, 60 cycle, 1-phase	Magnetic
RCR-2016B	22, 24	12.0	115 or 230 volts, 50 or 60 cycles 1-phase	Electronic
RCR-3525 RCR-3550 RCR-35100	22, 24 22, 24 22, 24	25.0 50.0 100.0	208 or 220 volts, 50 or 60 cycles 3-phase	Magnetic Amplifier



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MARINERS PATHFINDER* radar; Submarine Signal FATHOMETERS*; Marine radiotelephones; WELDPOWER* welders; Voltage stabilizers (regulators); Transformers; RectiChargeR* battery chargers; RectiFilteR* battery eliminators; Sonic oscillators for laboratory research; Standard control knobs; Electronic calculators and computers; Television receivers, Radio, television, subminiature and special purpose tubes; MICROTHERM* diathermy and other electronic equipment. *Reg. U. S. Pat. Off.

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the Hartford police investigation which led to the removal had "deprived him of his rights without trial or evidence."

Southern New England Telephone Co. removed Presmarita's telephone after Hartford police had charged him with booking horse race bets and had recommended the removal. Presmarita was not arrested.

It was reported that the telephone company had been withholding action in a number of similar cases pending the commission's decision of Presmarita's appeal, and that the decision would be used as the basis for future action. Whether the commission ruling would be appealed to the courts was not immediately indicated.

Main points at issue for its decision, the commission said, were whether the company's standards for terminating service were reasonable and whether the company had acted on advice of the proper law enforcement agencies.

It was noted that tariff provisions filed with the commission by the company provide that "service is furnished subject to the condition that it will not be used for any unlawful purpose. Service will not be furnished if such service is being used in violation of law."

The commission said this provision is reasonable and was the basis for the company's action in removing Presmarita's service. Noting that the company, in refusing to reinstall Presmarita's telephone, had acted only after receiving advice from State's Attorney Albert S. Bill, the commission said that the company had acted properly in this respect.

V V

Independent's New Rates Apply Upon Conversion to Dial

Minnesota Railroad & Warehouse Commission on Apr. 7 approved a schedule of rates for Twin Valley-Ulen Telephone Co. for its Ulen exchange upon its conversion to dial.

The dial rates are expected to produce $9,444 in operating revenues, net income of $2,190, and a return of 4.56 per cent on an original cost of property of $48,000. The company serves 112 local and 65 rural stations.

V V

Return of 5.6% Approved for Minnesota Independent

Increased rates for St. Augusta Rural Telephone Co., St. Cloud, Minn., were approved on Apr. 10 by Minnesota Railroad & Warehouse Commission.

Under the approved schedule, operating revenues would be increased

from $3,317 to $4,105 and net income from $264 to $791. On an estimated original cost of plant of $14,000, this would be a return of 5.6 per cent.

The company serves 131 rural stations.

V V

Arkansas Independent Seeks Sale Approval

Permission to sell the Decatur (Ark.) Telephone Co. was asked on Apr. 17 in a petition filed with the Arkansas Public Service Commission.

The owner was listed as Leona Alcorn and the prospective buyer as William D. Schmidt, her brother.

V V

Oklahoma Independent Seeks Rate Increase

Application for increased rates was received recently by the Oklahoma Corporation Commission from the Graham Telephone Co.

A hearing date has not yet been set.

V V

O.K.'s North Carolina Sale

The North Carolina Utilities Commission on Apr. 7 approved plans of the Carolina Telephone & Telegraph Co., Tarboro, to buy and operate the Princeton (N. C.) Telephone Co., which has about 150 customers in Johnston County (TELEPHONY, Apr. 12, p. 34). The commission in its order said the Carolina company should charge the new customers the same rates as it does in other towns of similar size.

V V

Ohio Merger Proposed

Petitions asking for the merger of Kitts Hill (O.) Telephone Co. with Ohio Bell Telephone Co. in Lawrence County have been submitted to Ohio Public Utilities Commission. A hearing was to have been held on Apr. 2.

V V

Southern Bell Seeks Sale OK

North Carolina Utilities Commission on Mar. 19 heard a request by Southern Bell Telephone & Telegraph Co. for permission to sell its exchange at Murphy to the Carolina Mountain Telephone Co., Enka.

V V

Nebraska Increase Sought

Application for increased rates on all classes of service has been filed with Nebraska Railway Commission by DuBois Telephone Co., which alleges inadequate revenues from existing schedules, with wages and prices of material still increasing in price.

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Creosote

is the only preservative that has kept wood sound and serviceable under severe conditions for more than 30 years

...creosote proves this statement with service records!

You can count on Koppers for creosote. With 18 creosote-producing and storage plants, Koppers can take care of your requirements. We'd like to give you our quotation when you're in the market for creosote. Get in touch with us.

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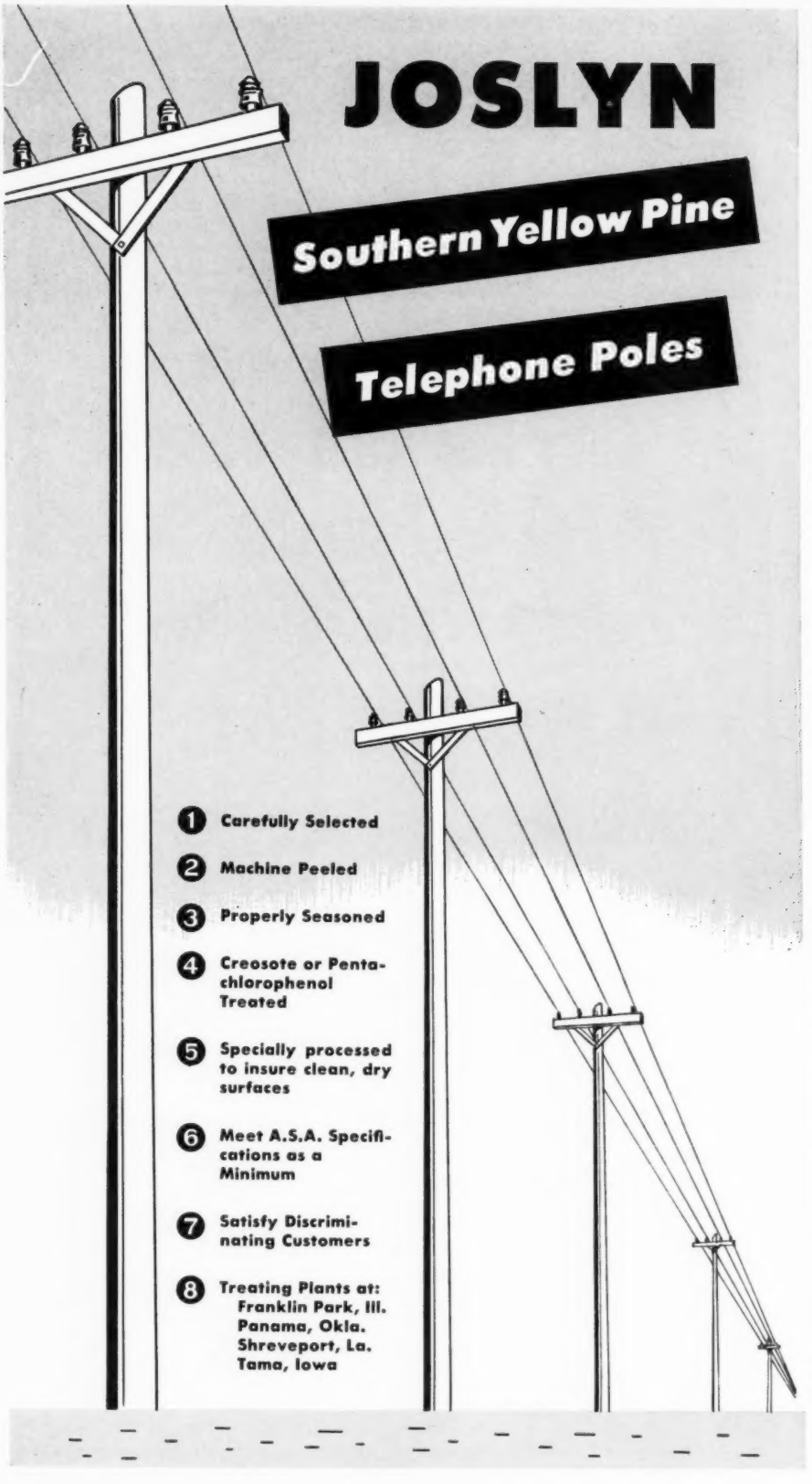
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Telephone Poles
1 Carefully Selected
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8 Treating Plants at: Franklin Park, Ill. Panama, Okla. Shreveport, La. Tama, Iowa

In the Nation's Capital

(Continued from page 18)

was the "dissenting minority." The situation was only cleared up when the President withdrew the disputed nomination and substituted another which the Senate promptly confirmed.

As for limiting the President's power to fire commissioners, the situation recalls several dismissals made by the late President Roosevelt: The late George Otis Smith, chairman of the FPC, was fired because he honestly differed with the President on water power policy. (Smith quit without protest.) Then there was the late Commissioner Humphries of the Federal Trade Commission who was fired over a policy disagreement. He took it to court but died before the Supreme Court could vindicate his right to hold office, which it did (by way of reimbursing his widow for loss of pay). In an allied situation, Arthur Morgan, former chairman of the Tennessee Valley Authority (TVA), was fired for policy disagreement; but in his case the courts made a distinction between an operating commission and a regulatory commission—so that the Morgan dismissal stuck.

The bill passed by the Senate, if finally enacted, should clarify this rather important point. If regulatory commissioners were to hold their jobs only at the pleasure of the President or governor appointing them, there would be an end to any semblance of independent or judicial judgment by regulatory commissions in deciding utility rate cases and other matters before them. Regulatory commissions would soon degenerate into political commissions, acting as puppets for the President or state governors. All important utility rate cases would then be decided at the White House or at a governor's mansion, instead of by the commissions set up by law to decide them.

Green Light for TV Expansion

The recent order of the FCC, unfreezing television station licenses which have been on ice for three and a half years, opens the way for considerable expansion of television networks. Eventually there will be more than 2,000 TV stations, which is almost 20 times the number now in operation.

Of interest to the telephone industry is the fact that the new stations would chiefly be in the western areas, largely unserved by television to date. This

means considerably more network cable for system interconnections.

Specifically the FCC order provides: (1) Seventy new television channels in the ultra high frequencies in addition to the 12 very high frequency channels now in use. (2) The table of local channel assignments (based on utilizing 52 channels) adds up to the probability of 2,053 new television stations in 1,291 communities throughout the country and its possessions. Under the presently available channels there would be a maximum of 400, of which there are only 108 stations now operating. (3) Educational and other noncommercial use will get a reservation of 242 local channel assignments. (4) A wide separation between TV transmitters and more uniformity of station and power limitations. (5) A reassignment of about 30 TV stations now in the very high frequency band.

FCC is going to start processing the new applications next July 1, giving first attention to those areas, such as the city of Denver, without TV service at all. Prompt action can also be expected in cases where there is no contest by a rival applicant.

V V

Canadian Bell Workers Cited For Saving Lives by First Aid

Two Bell Telephone Co. of Canada employes who saved lives during the past year were cited at a testimonial dinner recently in the Royal York Hotel, Toronto.

Donald G. Shaw of Toronto, an installer, saved a Massey-Harris employe who had accidentally come in contact with a strong source of electricity. Shaw, installing a telephone near by, gave first aid until the stricken man regained consciousness.

Ellis Rognvaldson of Guelph, Ont., plunged into the Niagara River to rescue a Buffalo woman from going over the Horseshoe Falls.

V V

J. J. Brown Named Nebraska Commissioner

Joseph J. Brown, secretary of Nebraska Railway Commission for a number of years, has been appointed by Gov. Val Peterson to serve the unexpired term of Commissioner Walter F. Roberts, who resigned to become personnel director of Lincoln Telephone & Telegraph Co.

The appointment was made in compliance with a statement of the governor at the time of Roberts' resignation that he would name the Republican who won the nomination for the full term of six years, beginning in 1953.

Yours for the Asking

This

Engineering Manual for Long-Span Rural Lines

Pertinent and timely information on how to build long-span, low-cost rural lines of *Crapo* High-Tensile Telephone Line Wire is contained in this illustrated Engineering Manual. The book is designed especially to assist engineers and construction crews in extending and improving rural service.

The contents include electrical and physical characteristics of both *Crapo* HTL-135 and *Crapo* HTL-85 Line Wires; tables of stringing sags and tensions; recommended construction practices; information on guying, metalicizing and transposition, river crossings, etc.

If you have not received a copy of this Manual, be sure to ask for one! Direct your inquiry to your distributor of *Crapo* Galvanized Telephone Wire and Strand, or write us for Manual No. 203.

Crapo HTL-135 Telephone Line Wire possesses two and one-half times the strength of standard B. B. wire; makes practicable spans of 350 feet in heavy loading to 500 feet in light loading districts. *Crapo* HTL-85 permits spans of 225 feet in heavy loading, 375 feet in light loading districts.

INDIANA STEEL & WIRE COMPANY
MUNCIE, INDIANA

Crapo HIGH-TENSILE TELEPHONE LINE WIRE

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Save time and cost on telephone line guying

Chance 8-way Expanding Anchors are the first choice of many users in the telephone industry. Reason? . . . They give more holding power for less money!

Chance 8-ways expand quickly—there are no bolts to cut—the holding wires shear with a single blow of the expanding bar. There is no wasted area . . . the weight of the load is carried by eight blades instead of only two or four.

P. S. The six-inch 8-way is especially good for rural line guying. Only one size need be stocked . . . it fits both ½″ and ⅝″ rods. It fits in a six inch hole and expands to 70 square inches.

C52-8

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CENTRALIA, MISSOURI
SAN FRANCISCO, CALIFORNIA

Importance of Insulation

(Continued from page 25)

impression is gained by reading about the very complicated methods sometimes proposed for bridge locations of cable faults, or by the lack of an available bridge for study and practice.

However, we would recommend that at first a simple method and formula be used, but not at a time when the pressure to clear a cable failure demands quick action—in other words, it is recommended that practice be made on man-made faults, thereby giving sufficient time for careful consideration of every step necessary in using the bridge.

Modern Cable Protection

Fig. 11 illustrates modern cable protection where no fuses are used. *Figs. 1A* and *1B* showed a fused terminal, the elimination of which we said reduced the number of troubles between the subscriber's station and the central office by 32 per cent.

We might ask what this has to do with insulation. As a matter of a fact, any lightning or power getting by the cable protection shown in *Fig. 11*, or any other protection, would never cause any cable trouble except by breaking down the insulation, causing either opens, shorts, crosses or grounds—therefore, it has much to do with this problem of maintaining good insulation in the cable. In reality, we do have fuse protection (which was shown by *Fig. 1B)* in the form of 22-gauge bridle wires which are between all line wires and the protector. The wires between the arrester and the unprotected cable terminal may be of any suitable gauge.

If the telephone circuit comes in contact with a power wire, the arrester discharge blocks are so arranged that they will ground the line solid. Excessive current flow from line to ground will cause the 22-gauge wires, acting as a fuse, to burn off.

Pressure testing with dry compressed air, or oil-pumped nitrogen, is highly recommended for checking all cable solder work to insure the quality of insulation being maintained. It is also useful for locating certain types of faults which are difficult to detect by visual inspection.

For example: Suppose that we have made a fault location by any of the available means, but are unable to see the sheath defect. By admitting gas pressure in the suspected area, then soaping the cable in that area, the

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Anchoring efficiency depends a lot on how your anchors are installed. Hole sizes need to be exact for greatest holding power. The adjustable auger helps you bore them right. Proper expanding requires the right kind of expanding bar. Chance Line Construction Tools help crews do better anchoring and simplify pole setting operations. Consult your Chance Catalog. Order from your regular supplier.

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exact cause of the trouble can, in most cases, be determined readily.

Restoring the insulation is usually a simple matter after the break has been located; however, we would recommend that a dessicant be used for removing moisture and restoring the insulation.

Pressure testing has many advantages over boiling the cable with paraffin. It is ready to use instantly, it is safe to handle, it will not injure the insulation, it will not drive the moisture back under the sheath, it will do no harm if spilled on sidewalks, buildings, etc. Obviously, this matter of insulation is too involved to permit discussion here of more than a few important phases of its use.

Various kinds of insulating materials are represented in wires used in the telephone business, and each one is intended for a specific purpose. Unfortunately, most of the insulating materials are more perishable than the conductors; therefore, we should employ every available means to prevent damage to them caused by lightning, mechanical failures, or moisture hazards, etc.

There are many simple precautions in the protection of insulation, in addition to those already mentioned, that should be considered, such as:

(1) Install station apparatus so that it will not be in close proximity to, or in direct contact with, electrical appliances, wires, cords and the like. Be sure the cords of the telephone will not be subjected to moisture from any cause whatsoever.

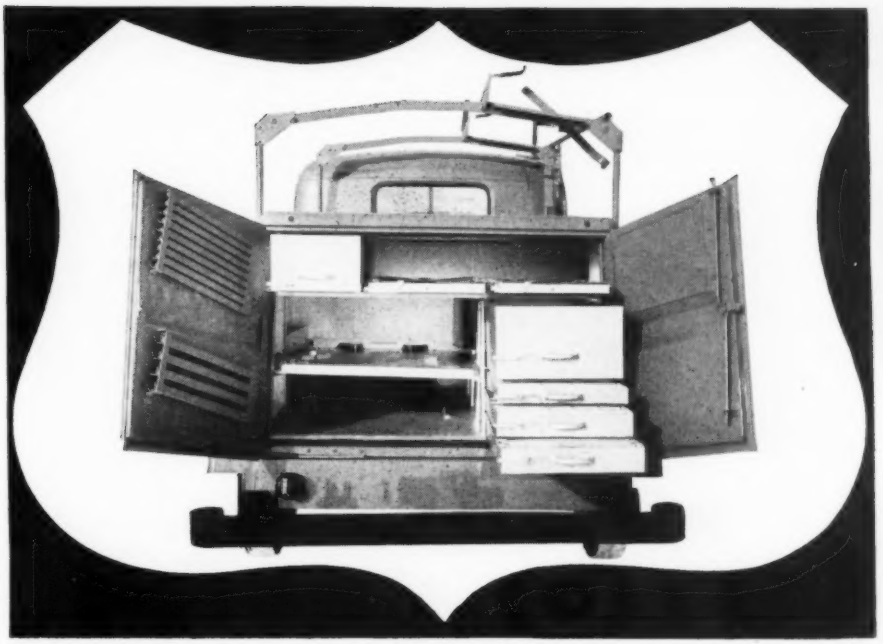
(2) Install good protection apparatus properly.

(3) Keep loop wires clear of trees, and observe sag rules.

We pointed out at the beginning how inferior insulation affects service on open wire circuits, and also how improper installation methods can be the cause of short insulation life.

These are minor items and usually can be repaired or replaced at comparatively small cost on a routine maintenance program schedule. However, the replacement of cable of any size becomes a major project; therefore, too much emphasis cannot be placed on the need of purchasing cable of high quality, and the importance of following approved cable methods of installation, construction and maintenance, especially in regard to the method of support.

In closing, let me say that an ounce of intelligently applied preventive plant maintenance practice is still worth 16 times as much as one pound of cure.



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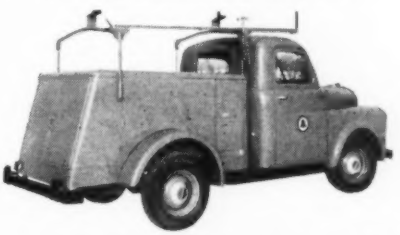
Compact arrangement-
Rugged Construction

The thousand-and-one pieces of material and tools that your installation, maintenance and servicemen need on the job are all at arm's reach in this compact, versatile Highway body. Designed, engineered, and Highway-built from the experience of thousands of installers and servicemen, it is scientifically arranged to place everything that the man-on-the-job needs at his finger tips. That's why this Highway IU-76 Installer's unit has become the standard of the industry.

The rear and side doors open to place at the disposal of the installer all the materials and tools he desires—drop wire reel, ladders, tree trimming equipment, wire and cords, screws, clamps, fuses, and all the other things that he must have on the job to avoid an unnecessary trip back to the shop. The workmanship on this body equals its efficient arrangement.

It has the rugged built-in strength to give years of service in all weather, on all roads.

Send today for your complete Highway catalog of public utility equipment. Or, call or visit the friendly Highway Distributor or Factory Branch nearest you.



HIGHWAY TRAILER COMPANY

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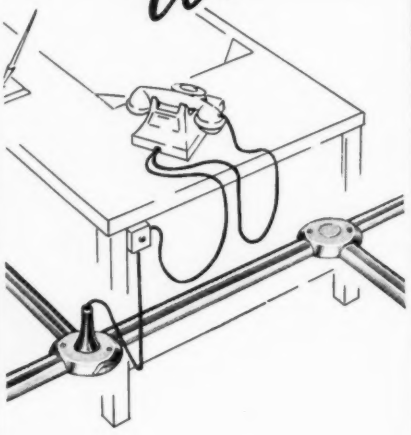

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Repairing and Rebuilding Plant

(Continued from page 32)

effectiveness of the test to rock the pole vigorously, take reasonable care not to swing the wires together, thus causing shorts or crosses.

(3) If the pole cracks or breaks in this test, it is unsafe to climb and must be braced or guyed.

(c) The foregoing pole test method is more severe than the method employed in routine tests and repairs of open wire lines. For this reason, do not apply the pike pole test to small (class 10) poles. Instead, brace or guy such poles if their strength is questionable.

(d) It is not practicable to test poles with wires, guys, and push braces so placed that the attachments will absorb the thrust of the pike pole and prevent much of the force from being transmitted to the pole. This is also true of poles that are set in banks or against obstructions in such a manner as to take the thrust of the pike pole. In such cases, the pole cannot be made to rock back and forth, so it will be necessary to properly support the pole.

(e) A misleading test may result if the ground is frozen or the pole is set in a paved area, as the pole butt then appears to hold firmly even though it is decayed. If it is suspected that surrounding pavement or frozen ground is interfering with the test, the pole should be properly supported.

(f) Poles that fail in the pike pole test shall be plainly marked to indicate that it is unsafe to climb. Caution: Do not assume that an unmarked pole can be safely climbed.

(g) Do not attempt to test poles in locations where a broken pole may cause property damage or bring telephone wires in contact with power circuits.

Poles 35 feet or shorter in length may be braced with pike poles in the following procedure:

(a) Place at least three 16-foot or longer pike poles spaced equidistantly about the pole at an angle of approximately 45 degrees with the pole and with the ends firmly set in the ground as shown in *Fig. 2*.

(b) Attach two cant hooks to the base of the pole at the ground line with the handles pointing at right angles to each other and in such a position that drawing the handles together will cause the hooks to grip the pole, preventing possible turning of the pole.

(c) Drive a digging bar into the ground at equal distances from the ends of the cant hook handles. Attach a rope to the digging bar.

(d) Fasten the free ends of the ropes to the handles of the cant hooks, drawing up the rope each time to firmly hold the pole with the hooks.

(e) If the butt is broken, drive digging bars into the ground around

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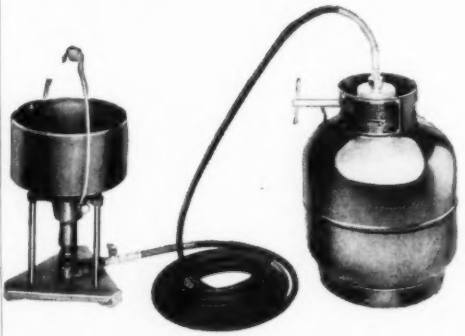
For Cable Splicers



Floor type furnace with fifty feet of hose to permit operation on splicing platform.

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the pole to secure the pole against kicking out.

If a truck with pole derrick is available and it can be brought up to the location of the pole, the derrick may be used to brace the pole in the following manner, provided that the pole does not extend more than 15 feet above the derrick head:

(a) Back the truck up to the pole until the derrick head rests against the pole.

(b) Pass the winch line around the pole and place the hook over the line. Lift the looped line up the pole with a pike pole or a wire raising tool, while, at the same time, taking up the slack in the winch line on the drum until the line tightens about the pole at the derrick head, as illustrated in *Fig. 3*.

(c) Cant hooks are not required to hold the pole base, but if the butt is broken, digging bars should be driven into the ground about the pole to prevent its kicking out.

Rope guys may be placed as shown in *Fig. 3*. The procedure is as follows:

(a) Support the pole by means of pike poles or a pole derrick as directed in subparagraph (a) and (b) preceding. Omit the cant hooks, but reinforce the pole with digging bars if the butt is broken.

(b) Climb the pole and attach four ¾-inch or larger ropes to the pole six feet below the crossarm on a one-crossarm pole, or just below the top crossarm, if the pole carries two or more crossarms. (This point of attachment should not be more than 15 feet above the pike pole points or derrick head.) Fasten each rope with a clove hitch on the pole and two half hitches on the rope.

(c) Attach two ropes, one each to a line pole on each side of and adjacent to the pole being supported, using the same tying arrangement specified above. Note: Test these adjacent poles first to make sure they are in good condition for anchoring the ropes.

(d) Tie the remaining two ropes, one each to a tree or digging bars on opposite sides of the pole and at approximately right angles to the direction of the line. See inset in *Fig. 3* for anchoring method with digging bars.

(e) Remove the pike poles or disengage the winch line and the truck derrick that were used to support the pole while the rope guys were being placed.

(f) When the height of the pole is such that it would be necessary to climb more than 15 feet above the attachment of the rope guys or braces in order to place guys below the top crossarm, attach intermediate rope guys. As soon as the highest guys are placed, the intermediate guys and the braces may be removed.

If it is not practicable to use the temporary supporting methods outlined in the preceding paragraphs because of sloping ground or obstacles interfering with the proper placing of the supports, the pole may be supported from one side as shown in *Fig. 4*. Use 16 feet or longer pikes and be sure to place them at an angle of not less than 45 degrees to the pole. If the pole extends more than 15 feet above the rope attachment shown in the illustration, place additional guys as explained in preceding paragraphs.

When a pole is to be replaced, as is usually the case where it is broken or cracked in the pike pole test, or is determined to be too badly deteriorated to be continued in service, the new pole may be set close to it and both securely lashed together. The work of transferring the attachments from the old to the new pole can then be handled from the new pole. Do not work from the old pole unless this is necessary, and then only after the lashings have been securely placed. Two lashings are required, one about five feet above the ground and the other at three-quarters of the pole height. One of the follow-

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Platform Clamps
Support splicer's platform from aerial cable —spun or otherwise. Won't slide on grade or damage cable. Bronze alloy.

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specially designed for spun cable, may be used on cable with any other kind of support. Clamps on strand. Won't slip on grade or damage cable. No wrench is needed. Bronze alloy.

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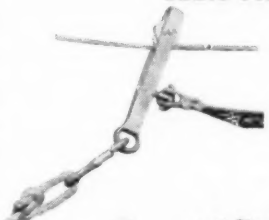
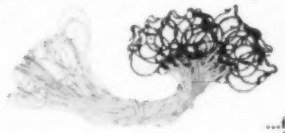
offers means of pulling cable in and takes down pull on tow line to truck. Cadmium plated steel with bronze bushing.



Cable Placing Shoe
is used ahead of spinner to raise cable from reel to strand in placing and spinning cable. Also used stationary at pole when placing with rings.



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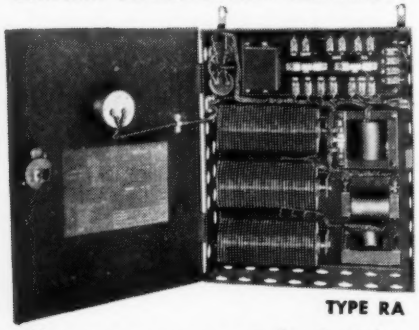

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ing types of lashings may be employed as follows:

(a) *Rope lashing:* Place three wraps of ¾-inch rope around the two poles. Thread the rope between the poles and serve this end three times around the rope wrapping already in place about the poles, drawing each turn up tight. Tie the ends with a square knot.

(b) *Strand lashing:* Wrap a length of 6,000-pound strand in a single figure-8 around the poles, draw up the ends and fasten them together with a 3-bolt guy clamp. Locate the clamp near the cross over of the strand between the poles, tape the ends of the strand, and cut the ends off as close to the clamp as practicable.

(c) *Wire lashing:* Place six wraps of 109 steel wire around the two poles. Thread the wire between the poles and serve this end six times around the wire wrapping already in place about the poles, drawing the wire up tight each time. Pigtail the wire ends together and bend the pigtail down out of the way.

Safety Precautions—Handling, Loading, and Hauling Poles. The operations of placing or removing poles, unloading poles from trailers or railway cars, loading poles on trailers, transporting poles, and storing poles in yards or on the job require careful handling of the poles to avoid strain or more serious injuries.

The following precautions are needed to avoid hand and skin injury:

(a) To prevent running splinters into the hands, or blistering or chafing the hands, gloves should be worn while handling or working on poles.

(b) Exercise care where you place your hands to avoid getting them pinched or bruised in handling poles.

(c) Follow precautions outlined in First Aid Instructions for the protection of skin from creosote burns when handling or working on creosote treated poles.

A winch line and pole derrick should be utilized in transferring poles from a pole trailer or storage pile to the job location or vice versa. Where this equipment is not available or its use is not feasible, and it is necessary for the workers to carry the poles, the following precautions will minimize the possibility of strains or falls:

(a) Light-weight poles should be carried, one at a time, by at least two men. In carrying, the pole should be rested on the hip with the hands holding the pole, rather than borne on the shoulders.

(b) When heavier poles are involved, obtain sufficient help to make carrying a safe and reasonable easy operation. Use carrying hooks on large poles.

(c) Since it is difficult to control the movement or direction of a freely rolling pole, which may strike a worker or be damaged by hitting an object on the ground, poles should not be rolled

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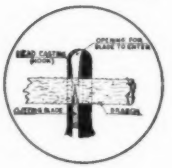

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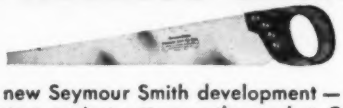

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off piles, unless necessary as in the case of unloading flat cars and, in a few instances, removing poles from storage piles or trailers where other methods are not practicable. When poles must be rolled, workers not actually assigned to rolling off the poles must stay in the clear until all poles have been brought down in this manner. No attempt should be made to stop or pick up a rolling pole.

(d) In carrying the pole over rough terrain or on slippery ground, go slow and step carefully to avoid stumbling or slipping.

(e) If the pole is lying on the ground or at a low level (on skids), it should be raised to the carrying position by bending the knees to get down to the pole, taking hold of the latter, and then straightening the legs slowly while keeping the back straight. All members of the carrying team should lift at the same time on the proper signal given by one man.

(f) When the pole is at the position where it is to be set down, all members of the carrying team should let the pole down slowly and carefully on signal by the designated person. Do not drop or throw the pole onto the trailer or storage pile.

In handling poles with winch equipment, observe the following precautions:

(a) Operate the winch slowly and be in readiness to stop it quickly on signal. Take care not to allow the winch line to pile up on the drum, as the line may slip off the top of the pile-up and drop the load suddenly with possible injury to someone.

(b) When unloading or loading poles on a trailer, do not carry more poles on a winch line than can be easily and safely handled. Adjust the winch line just above the balance point of the load, so that the poles can be guided by one hand and kept from swinging as the load is being transferred. (These precautions will minimize the possibility of muscular strain.)

(c) While transferring the poles, spot the truck in a position to bring the derrick head directly over the attachment of winch line to the load being picked up. The load will not then shift to one side as the winch line tightens on picking up the load. With the winch line at an angle to the point of attachment, the load is apt to slide to one side as it is being lifted and may injure a worker.

(d) Avoid getting under a pole or load of poles being carried on the winch line. Something may give way and drop the load. *Stay in the clear.*

The unloading of poles from railway cars shall be handled in accordance with instructions from the construction superintendent.

The following precautions are required in loading pole trailers:

(a) Several types of pole trailers are in general use by construction and maintenance forces. These differ in load capacity and care should be taken not to load more poles on a trailer than it is designed to carry, particularly if it is a light-duty type.

(b) If the trailer is not hitched to a truck, block the wheels securely to prevent it from moving backward or forward while it is being loaded.

(c) In loading poles on a trailer with a pole derrick and winch, place the poles on the trailer from the side or end depending on the space available behind the truck. If the trailer does not have a tongue, bind the lead pole to the trailer securely so that this pole will not change position when the other poles are loaded or when the trailer is in motion. In this case, the drawbar should be securely bound to the tongue of the trailer to prevent swaying of the load while traveling on the road. Use stakes when a number of poles are loaded on the trailer, if the trailer has stake sockets for the purpose. Bind the load with the standard pole binders provided. Be sure the pole binders are securely locked, so that none of the poles will come loose while the trailer is in motion.

The following precautions should be observed in hauling poles to and from a job location:

(a) Local highway regulations should be carefully followed in transporting poles.

(b) Wherever practicable, a routing should be selected to avoid hauling

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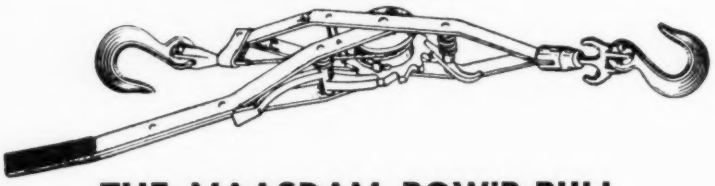

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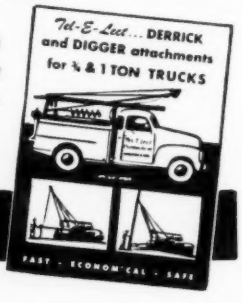

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poles in heavy traffic, on slippery pavement, and on steep hills.

(c) The trailing end of the pole load shall have a red flag attached to it. If the hauling is done at night, a red light should be used at this end. As a further safety measure, it is advisable to post warning flags or lights between the front and rear ends of loads.

(d) When turning corners, entering upon the highway, or crossing at an intersection, send one man ahead to warn the traffic. This man should also check clearances when the truck and trailer are turning corners in cities. At unprotected railroad crossings or dangerous intersections, have a flagman guide the traffic, if this is necessary.

(e) Whenever required for additional safety, the trailer should have a safety line (chain or cable) connected between truck and trailer and pulled taut. Should the drawbar connection break, the safety line will prevent the trailer from becoming detached or going out of control.

The temporary storage of poles at the job location should be handled as follows:

(a) When poles are distributed along streets or highways, they should be laid on the shoulder of the road, away from the traffic. Avoid locating poles on driveways, at sharp turns, or where they will interfere with drainage. If the poles are placed on sloping ground, securely block the poles to prevent rolling.

(b) If the poles are in locations accessible to children or unauthorized persons, secure the poles to other poles or objects or nail cleats to the poles to prevent them from being rolled into the roadway and to keep children or other persons from being injured as the result of their rolling or slipping.

(c) If the poles must be laid close to or on the roadway, they should not have crossarms or steps attached. If practicable, they should be placed with the top end toward the oncoming traffic.

(d) Danger signs by day or red lights or flares should be placed, if necessary, for additional protection to the traffic.

(To be continued)

v v

OBITUARY

WALLACE BANTA PHILLIPS, 66, president of Pyrene Mfg. Co., with which C-O-Two Fire Equipment Co. is affiliated, died on Apr. 14 at Roosevelt Hospital, New York City.

Mr. Phillips was born in New York City, Mar. 30, 1886. In his lifetime he was active in the United States and abroad in the affairs of various corporations, the World War II Office of Strategic Services, safety groups, chambers of commerce and numerous clubs. He is survived by his widow, Ann Lewis Phillips.

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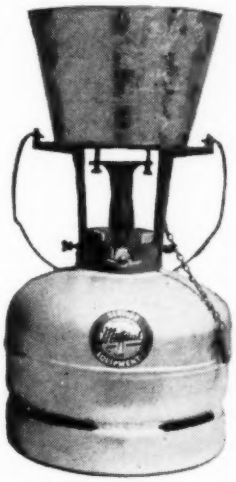

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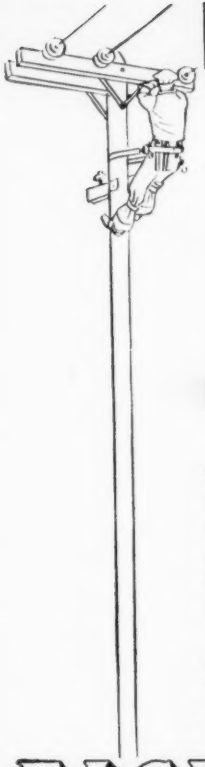

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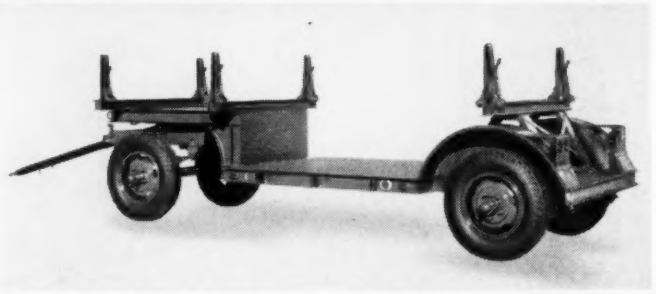

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Iowa Annual Convention

(Continued from page 54)

cannot pay for past expansion and, at the same time, provide for today's rapid growth, he said. He continued:

"While loans to utilities are for capital purposes, and a commercial bank because of its very nature must be mindful of liquidity, the two objectives are not incompatible. Financing a construction program with commercial bank money is an intermediate step between financing capital additions from earnings and from the sale of permanent securities, and it is based upon the assumption that bonds and preferred or common stock may be sold more advantageously on demonstrated than on estimated results.

"In connection with its loans to utility companies, Chase has used what is known as the standby construction credit. Under such a credit, the borrowing company may, by contract, avail itself of monies up to a stipulated amount during a construction period and is permitted a stated time thereafter in which to demonstrate the anticipated earnings resulting from the construction before securing permanent financing.

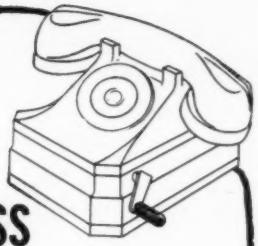
"For a commercial bank to consider favorably a loan of this type, it must be for a sound purpose, such as improved service or greater efficiency. A temporary loan, substantially to replace other indebtedness or to provide for deferred maintenance, is not considered sound. Lastly, since a commercial bank must have confidence that a company's management is fully qualified to operate the company in a sound manner, capable management is a prerequisite to a bank's willingness to extend credit. In this connection, it is necessary to know that the company is either large enough or will become large enough to retain management in competition with other sources of employment."

Ray J. Riordan, La Crosse, Wis., chairman of a committee of the Iowa association to prepare a model tariff for the use of Iowa Independent telephone companies, reported on the committee's work, and presented a proposed tariff drawn up by the committee. Riordan also is chairman of the Commercial Committee of the United States Independent Telephone Association.

He emphasized the importance of all telephone companies having a set of rules and regulations, and urged Iowa companies to inspect the model tariff proposed by his committee and to give consideration to adopting it or using it as a guide for drawing up their own tariffs.

The report of the Iowa association's Small Company Committee was presented by John J. McIntosh, Cedar Rapids, general manager of Central

Good service is good business



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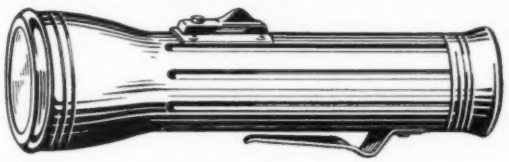

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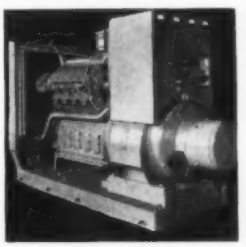
RAY-O-VAC CANADA, LTD., WINNIPEG, MAN.

. . . the best insurance of continuous telephone service is a "U. S." stand-by electric plant!



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Iowa Telephone Co. The Iowa association has a general Small Company Committee and five district sub-committees which have made tremendous progress in aiding small companies to rehabilitate and expand their plants, in securing private capital and in modernizing their corporate structures.

These committees are composed of 48 members, all representatives of either large or small companies, who contribute their time and effort to help other companies get their "houses in order."

The extent to which these committees have succeeded in protecting and furthering private enterprise in the telephone industry in Iowa was reported in the Feb. 9 issue of TELEPHONY.

The convention re-elected the following directors: C. A. Farrington of Centerville; W. H. Fowler of Pella; Frank Gordon of Fort Dodge; Fred G. Pyle of Newton and E. B. Zerwas of Manning.

Others elected directors are: John J. McIntosh of Cedar Rapids, to succeed Sutherland Dows of Cedar Rapids; Harold Thompson of Clear Lake, to succeed E. L. Hons of Paulina; Arthur Sanders of New London, to succeed A. J. Harty of Kansas City, Kans.; Verne B. Clark of Lincoln, Neb., to succeed Ray J. Riordan of La Crosse, Wis.

The directors elected the following officers: C. C. Pearce of Riceville, president; E. G. Carlson of Creston, first vice president; Ross Vernon of Sioux Center, second vice president, and W. F. Miller of Des Moines, secretary-treasurer.

V V

Travelers Company Issues 1951 Shocking Auto Accident Totals

Nearly two million casualties, the worst automobile accident toll in the nation's history, were recorded in 1951, according to figures released recently by The Travelers Insurance companies.

The findings of Travelers as to these accidents should be of more than passing interest to operating telephone companies in their employe safety first programs.

Last year's traffic deaths totaled 37,100, an increase of 1,600 over the 1950 mark. The injury count soared to 1,962,600, more than 160,000 over 1950, it was reported.

The death and injury totals are highlight statistics from "Lucky You," 18th in the annual series of traffic accident data booklets published by The Travelers.

More than 13,000 persons were killed and 570,000 injured last year by

drivers who were exceeding the speed limit, according to the report. Excessive speed was "far and away the most dangerous mistake in driving" in 1951.

More than 11,000 drivers under 25 years old were involved in fatal accidents and 416,000 more in personal injury accidents, the figures reveal.

Pedestrian experience in 1951 is termed "an island of encouragement in last year's ocean of accidents." A comparison of 1951 with 1950 shows that pedestrian deaths were "held in check" while injuries were reduced by nearly 9,000.

Other facts from "Lucky You":

Saturday was the most dangerous day of the week to drive.

More persons lost their lives during the hour from 6 to 7 p.m. than in any other hour. Injuries hit their peak two hours earlier, from 4 to 5 p.m.

Ninety per cent of drivers involved in 1951 accidents were males.

Ninety-seven per cent of drivers involved in 1951 accidents had at least one year of experience behind the wheel.

Thirty-eight per cent of last year's fatal accidents occurred on the open highway.

There were 92 per cent more fatal accidents on icy roads last year than in 1950.

V V

Honored by Independents For 35 Years of Service

Mrs. Rose Carr, operator for Missouri Telephone Co. at its Clark exchange, is wearing a 35-year service pin of the Independent Telephone Pioneer Association which was presented to her recently by G. T. Winn of the Missouri company in behalf of the Pioneer association.

Mrs. Carr worked for New Century Telephone Co. from March, 1917, until that company was purchased by the Home Telephone Co. She continued working for this company until it was consolidated under the present Missouri Telephone Co.

Mrs. Carr is a member of the Theodore Gary chapter of the Independent Telephone Pioneer Association.

V V

"The government under its present leadership proposes to spend as much the next fiscal year, which is allegedly a peace time year, as the government spent during the entire 136 years from 1789 to 1925, which period included the Civil War and World War I. It is time the citizen who has a farm or a home starts thinking about the title to his property. How long is it going to be before he is going to lose them to the government for taxes?" — Long Prairie (Minn.) *Leader*.

it's dated

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NEOPRENE JACKETED DROP WIRE

LASTS LONGER • COSTS LESS!

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You, too, may know all this for sure by trying Alphaduct drop wire. And . . . by dating the wire we make it easy for you to prove to yourself that this is the most sensible drop wire investment you've ever made.

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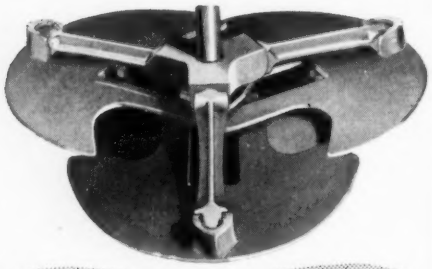
QUICK INSTALLATION
TOUGH FOR LONG LIFE



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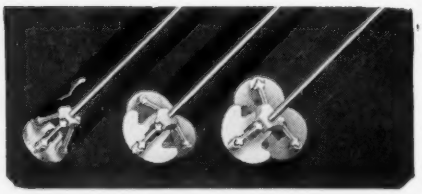

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EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

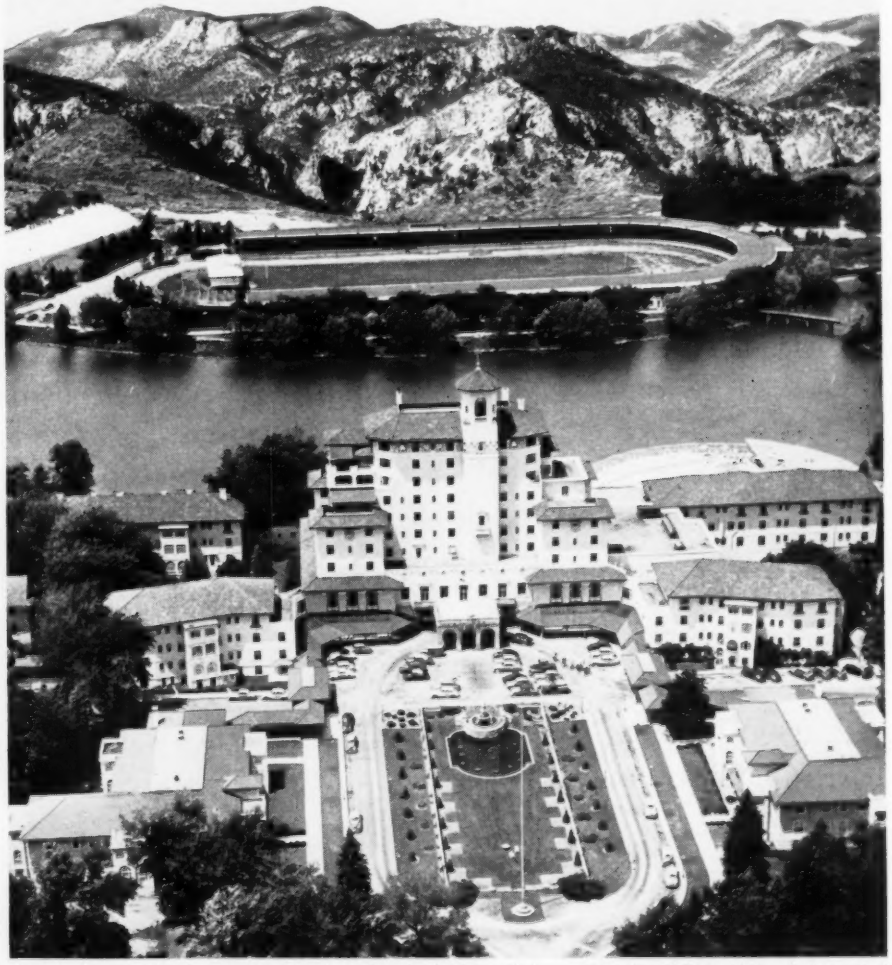
Trouble Clearing

(Continued from page 34)

of cable sheath are now being tried out, each type should be analyzed in a separate column so that the results on each type can be compared. The last column may be used for totals. The box at the top of each double column is for the type of cable. We show blanks for the "per 100 sheath mile" figure on each individual item; however, this will ordinarily be computed for only the seven subtotals and the grand total. Another interesting results figure that could be added to this form is: "Working pairs affected per case of trouble." This would be obtained by dividing the cable trouble sheath shown on the regular trouble summary by the number of cases shown on this report.

Where cable is under gas pressure, the low pressure alarm will warn of much trouble before it has caused trouble reports. These cases should probably be analyzed separately. However, as very little exchange cable is gassed, we have not shown this on our sample form.

The technique of locating and clearing cable trouble has been well covered from time to time in TELEPHONY. We will add a few thoughts of our own. By far the greater part of aerial cable trouble, even in a large exchange, is located by the cable tone and exploring coil method. A small company that has more than a hundred feet or so of entrance cable should purchase one of these sets and learn how to use it. We know of several small companies who depend upon borrowing a cable man from some larger company whenever they have cable trouble, but the man does not usually get there in time to prevent a complete cable failure or to get the trouble before it dries out. The amplifier is a valuable addition to this set and is well worth its cost. Without the amplifier, it requires a man with very good hearing to do the best work with an exploring coil and then he may have difficulty in a noisy location such as on a busy street. With the amplifier, no one should have trouble hearing the tone and, it has the further advantage



Aerial view of the Broadmoor Hotel, Colorado Springs, Colo., where the United States Independent Telephone Association Executives Conference will be held on May 8 and 9.

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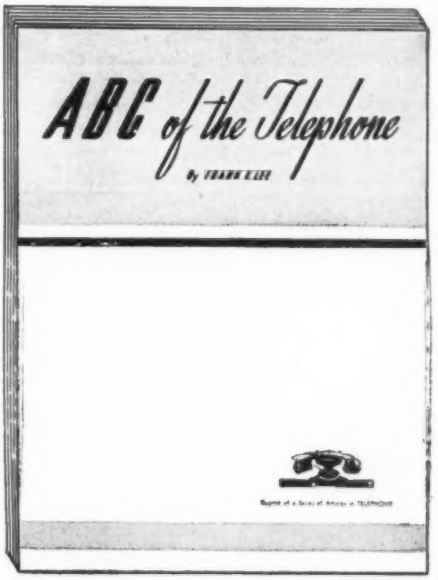

Volume I is an 84-page booklet of 21 installments of the popular series by Frank E. Lee, appearing currently in TELEPHONY. Over 8,000 copies have been mailed domestically and abroad. Includes circuits, transmitters, receivers, induction coils, generators, ringers, relays, line protection, dials, automatic switching, principles of protection, drop wire installations.

Volume II is an 80-page booklet of 20 installments. Covers installation and maintenance of Sub-Station Protectors, Station Wire Installation, Subscriber Installation, Fault Locating, Relay Circuit Analysis, Planned Maintenance Program, Electronic Testing of Aerial Cable and Drop Wire, Plant, Transmission Developments and Loading Coil Theory.

Either volume can be bought separately. We suggest, however, that you combine your requirements for both and take advantage of the following lower quantity prices.

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2 to 25 Copies	**1.35 Each**
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XUM

that it is practicable to fasten the exploring coil on the end of a pole and work from the ground.

The Wheatstone Bridge is used in large exchanges to obtain an approximate location on long cables, after which the final location is obtained by applying the tone at a nearby terminal and using the exploring coil. The fact that the bridge often gives only an approximate location is not the fault of the bridge (which is a precision instrument), but is due to certain variables and unknowns in the cable. The bridge also requires a man with considerable knowledge and experience to operate it, and a good bridge is somewhat expensive. A small company with aerial cable only cannot justify the purchase of a bridge.

However, some small companies now have a large amount of buried cable. In that case we believe that a good bridge should be purchased and someone trained to use it. In the case of buried cable, digging at several points may be necessary. If the trouble is not found within a few feet either way from the bridge location, an opening may be made to determine the direction of the trouble and a new location obtained by connecting the bridge at the opening already made. The trouble should be found on the second or third trial. In the case of underground cable in conduit, the bridge will always determine between which two manholes the trouble is located. The trouble is usually cleared by drawing a new section of cable into a spare duct and splicing at both ends.

Speed is the most important factor in locating and clearing cable trouble. If the trouble has already spread throughout the cable and a large number of telephones are out of service, the company will naturally want to clear the trouble in the shortest possible time. If the trouble has been caught in time, the objective is to stop it before it spreads. This also calls for speed. When a case of trouble has been "run into the cable," someone must be assigned to the cable trouble at once. If there is only one repairman, he must drop everything else and concentrate on the cable trouble because by so doing he can clear or *prevent* the largest amount of trouble in the shortest time.

Some years ago when telephone companies were not as trouble conscious as they are today (and the cable fills were not so heavy), it was a common experience to see a repairman change a pair to clear a case of trouble, then come back to the same location within an hour to change pairs on two more lines. In another hour he would be back again with several cases of trouble. This time he has difficulty finding clear pairs to change to, and he finally wakes up to the fact that he has a cable failure to deal with.

Now, many companies have made the rule that a cable pair must not be changed on account of cable trouble if the trouble is of a type that can be located and cleared. The time required to change a pair can be better used in locating the trouble, and it is better for one subscriber to wait awhile than for a cable failure to get a head start. In this connection a pair which tests "open" from the office end will often test "short" or "grounded" when tested from the terminal and, therefore, can be located and cleared.

This question is often raised: "Should the cable sheath be opened for single pair trouble if there are spare pairs in the cable?" The trouble, of course, should be *located* at once and a thorough examination made at and near the location for a sheath defect. If no sheath defect can be found and the trouble is "solid," it is permissible to change the pair and report the case as "not cleared." Of course, a record should be made of this location. However, if the trouble tests "wet," it cer-

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Acorn characteristics: beautiful, smooth surface, easily cleaned, highly moisture resistant, and unaffected by acid, fumes, oil and sun light.
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tainly should be cleared even though no sheath defect can be seen. In the case of buried cable, if an excavation has been made at the location, the trouble should be cleared before backfilling. In underground cable it may be well to wait for the second case of even wet trouble before starting the costly job of pulling in a new section of cable.

Will the tools and material be ready when cable trouble comes? It would be convenient to have a complete outfit on each truck, but this may require too much investment. Another plan is to have a trailer at the storeroom always kept loaded with all that will be required to locate and clear a case of cable trouble and to close the temporary opening. No time will be lost in locating the necessary articles, but, like a fire truck, it will at all times be ready to go. The man who is assigned to the cable trouble drives to the storeroom, hitches the trailer to his truck, and is on his way. It will require some supervision to make sure that this trailer is ready at all times. After each use it must be inspected and any missing articles replaced just as a fire truck is put in condition to go out again as soon as it returns to the station. A list should be made of the tools and materials to be kept on the cable trailer.

Some of the things that should be kept on this trailer are: Tone and exploring coil outfit; chipping knife and hammer; cable slitting tool; desiccant and/or paraffin boiling outfit; platform and tent; traffic guards, lanterns and flags; emergency lights; piecing wire and sleeving, and materials for closing sheath openings.

Many small companies believe that only an experienced cable splicer can clear cable trouble. However, this is a job that every outside repairman can and should learn. A new technique is to slit the sheath lengthwise with a special tool which makes a clean cut. The edges of the slit are then spread apart to gain access to the conductors. Desiccant or paraffin may be poured through this opening. Afterward the edges of the slit may be drawn together and soldered by any good workman. If the sheath has to be removed, the opening should be properly taped and the two ends of the sheath bonded together. The opening will then be safe for several months. When several of these openings have accumulated, a good cable splicer should be employed to permanently close them.

Each case of cable trouble should be studied to determine its cause and how it could have been prevented. Thus, if the trouble was apparently due to lightning or to a power burn,

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Hot Galvanized

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"Hang the Load on Hubbard Hardware!"

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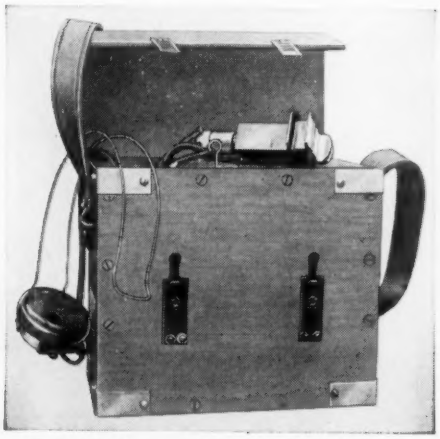
LINEMAN'S TEST SET

☆ Tells Direction and Location of Trouble Without Cutting Wire or Opening Line.



Illustrated with protective battery cover, detector coil and receiver.

modern circuit

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compact . . .
light weight
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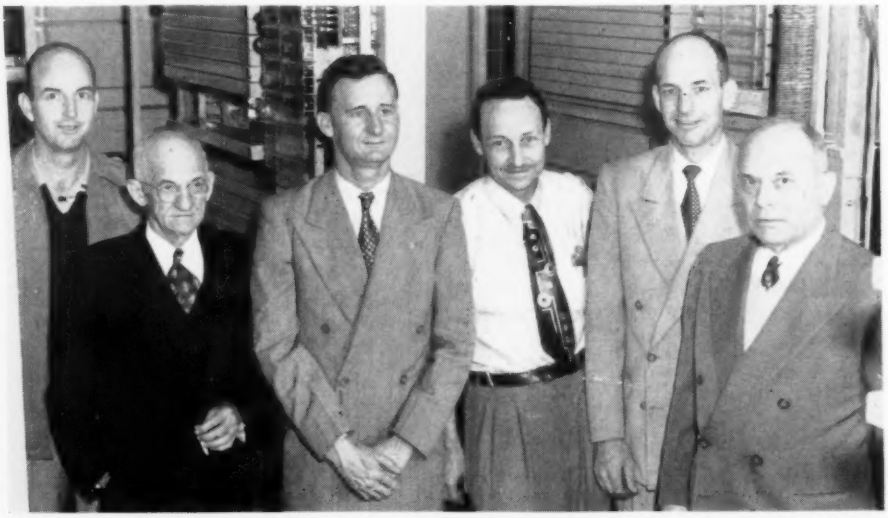
a thorough inspection should be made to determine where the current entered the cable and why. Were all the required protectors in place and in good condition? Were all clearances from power wires standard?

In this connection, the cable is the most important part of the plant to be protected from lightning and power wires. A small company will do well to obtain protection specifications from engineers of the Bell System or of some large Independent company. These specifications are being continually changed and improved as new facts are discovered.

The "Exchange Cable Trouble Analysis" form should also be studied each month or quarter and the results on each item compared to that of previous months. The results should also be compared with the results of other companies, especially the larger companies. This form will point out the items that are out of line and show how they may be improved.

(To be continued)



Officials at the cut-over of Union Telephone Co.'s exchange at Smackover, Ark., included (left to right) H. B. WILBOURN of Southwest Arkansas Telephone Co. and Sheridan Telephone Co.; E. B. RHODES of Home Telephone Co., Fordyce; JAMES ROWE of the Union company; PAUL MURNAHAN of Stromberg-Carlson Co.; C. T. ADAIR, president of Arkansas Telephone Association, and JOHN W. CARTER of the Union company.

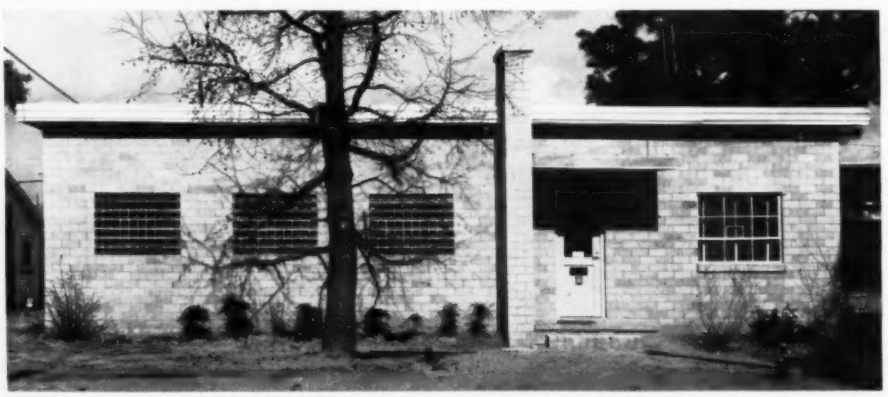
Union Company of Arkansas Now 100% Dial-Operated

The Union Telephone Co., Smackover, Ark., recently completed the conversion of all its exchanges to dial operation with the cut-over of the Smackover exchange. The company operates other dial exchanges at Calion, Norphlet and Mt. Holly, all in southeast Arkansas. The dial conversion program has been under the direction of John W. Carter, secretary-treasurer of the Union company.

Smackover and the other three exchanges have a total of 1,350 dial stations with El Dorado, Ark., as the toll center. Approximately 515 of these stations are rural. The Union company is reported to have one of the best rural developments in the state.

The cut-over of the Smackover exchange was attended by about 115 people. It was held in the new fireproof building of the company and was concluded with a buffet supper served by the retiring chief operator and her staff. The mayor of Smackover placed the first long distance call to the *Arkansas Gazette* in Little Rock.

Secretary-treasurer Carter is well known throughout the South for his untiring efforts in the telephone indus-



A view of the new business and central office building of Union Telephone Co. at Smackover, Ark.

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Pentachlorophenol or Grade 1 Creosote Oil
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IDAHO POLE COMPANY
SANDPOINT, IDAHO

try. Exactly 26 years from the date he first organized the Union company, he effected the cut-over to dial.

v v

Florida Company's Construction Limited by Insufficient Income

A construction budget for 1952 of approximately 6 million dollars was approved by the board of directors of Peninsular Telephone Co., Tampa, Fla., after the annual stockholders meeting held on Apr. 9.

Directors were told by Carl D. Brorein, president, that a desirable construction budget for the current year would involve an expenditure in new plant of about 9 million dollars. But after considering the program, the board determined that the company could not finance the construction by the sale of its securities at terms considered reasonable, until it receives an increase in its rates over those provided by the present rate structure which was established 25 years or more ago.

Peninsular officials said that the reduction in the current construction budget inevitably will result in a further substantial increase in waiting orders. The reduced amount of proposed expenditure can be expected to affect seriously the provision of facilities to meet the service demands of this area. Despite this, Brorein says the company will do all it can to meet increased demands for service to the best of its ability.

Peninsular directors pointed out that even with the construction that has taken place in the last few years—more than 8 million dollars spent in 1951 alone—there are still 12,000 applicants for telephone service awaiting installation, with thousands more waiting to be changed to a higher service classification.

The Peninsular company now employs more than 1,800 people. Since the end of World War II, the number of telephones in Peninsular territory has increased over 110 per cent, to the present total of 175,000. During the period the company's investment in telephone plant rose from 15 million to 36 million dollars.

Brorein pointed out that the Peninsular system was the first one of its size in the nation to furnish all-dial service. He added that during the past two years equipment has been installed which permitted several exchanges to join the nation-wide long distance operator dialing network, with the remaining exchanges to be placed on the system in a few months.

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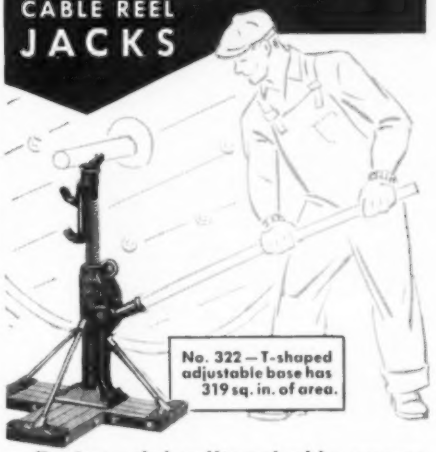

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Catalog TB9 upon request.

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SIGNAL
ENGINEERING & MFG. CO.
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Wood Preservation Development Discussed at Chicago Meeting

An urgent need today for speeding the development and acceptance of wood preservation was told to editors of trade papers recently at a meeting in Chicago by J. A. Hall, director of the U. S. Forest Products Laboratory.

The occasion for Hall's talk, "Opportunities in Wood Preservation," was the preview of a new industrial motion picture, "Treat Wood Right." More than 150 editors and executives of railroad, utility companies, and other industrial users of wood attended the luncheon meeting sponsored by the Dow Chemical Co., producers of the movie.

Hall pointed out that, in spite of the fact that treated ties and poles amounted to 227 million cubic feet of treated wood annually, the figure still represented less than 2 per cent of the wood cut.

Urging further utilization of existing materials and facilities for treating as conservation measures, Hall stated, "The need for treated wood arises anywhere that wood is used under conditions that expose it to the attack of micro-organisms or wood destroying insects. I do not know how large this market may be, but from my own observation I am convinced that it is enormous."

GEORGE FINCH (left) of the Jam Handy Organization, producers of Dow's new colored motion picture on wood preservation titled "Treat Wood Right," talks to J. A. HALL, director of the U. S. Forest Products Laboratory, at press luncheon and showing of the film recently in Chicago.

Hall stated that there are two things necessary to foster further use of wood preservation: Educational and promotional work to show the public the value to be obtained; and distribution of preserved wood so that it can be available to those who need and want it. The movie showed test results and treating methods for various industrial applications of wood with pentachlorophenol, a new product.

Referring to the fact that only a relatively few years of field application have elapsed to permit a final opinion on pentachlorophenol and other new materials, and appealing for well-designed accelerated tests, Dr. Hall stated, "We cannot afford to wait the long years of normal use to find out whether they are good or not. We have accelerated progress by putting out small pieces under more rigorous conditions of exposure."

Speaking of the chemical industry, Dr. Hall commented, "The product we are considering today is a product of the chemical industry. Its formulation and development were originally based upon research that demonstrated the applicability of certain molecular structures in the wood preservation field."

'52 P&H PENTA

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FULL LENGTH TREATED *NORTHERN* WHITE CEDAR

P & H Treatment insures against sapwood deterioration and termites. Uniform results of Penta treatment assured by laboratory control—proven by ten years use.

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V V

York-Hoover Celebrates 60th Anniversary

The York-Hoover Corp., York, Pa., manufacturer of specialized commercial and utility truck bodies, is celebrating its 60th anniversary this year.

The principal element of the present York-Hoover Corp. had its corporate beginning back in 1892, although its inception preceded this date by 17 years.

The firm then manufactured and sold horse-drawn wagons of many designs

and capacities for practically all of the then existing vocational purposes.

In 1908, when the fast-growing motor truck industry began replacing the horse-drawn wagon, York-Hoover pioneered in this conversion by placing commercial bodies first on the available passenger car chassis and then on various truck chassis as they appeared on the market.

It also started to build the "Hoover" truck and sold these in some quantities until 1912 when the rapid expansion of the commercial body business necessitated the use of its entire manufacturing facilities for this purpose.

Among York's current products is a complete line of body units for the public utility field.

V V

New Midget Plier-Snip Marketed by Utica Corporation

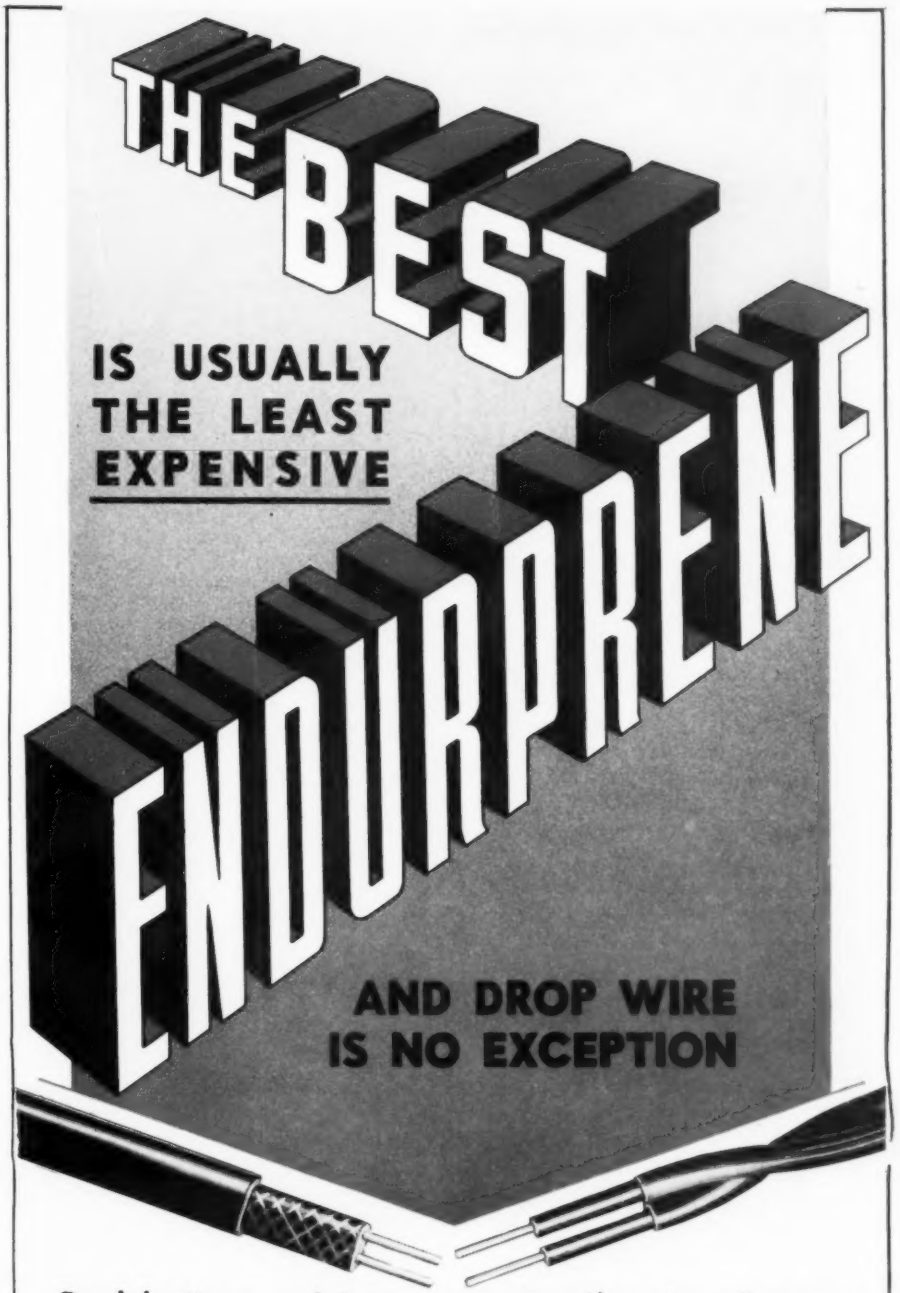
Utica Drop Forge & Tool Corp., is now marketing a new 4½ inch Plier-

Snip No. 101 which is applicable wherever fine wire cutting or thin metal snipping is needed.

Originally designed for use in electronic and incandescent lamp manufacture, the pliers features an extended throat for greater reach in cramped quarters without reduction in leverage. The pliers is drop-forged for toughness; the cutting edges are hand-honed.

V V

»» Someone has said that the bigger a man's head becomes, the easier it is to fill his shoes.



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TELEPHONE DIVISION

Paragon Electric Co. Two Rivers Wisconsin

Soldering Gun Designed By Wen Products, Inc.

A transformer type soldering gun which heats instantly (in 3 to 5 seconds) when the trigger is pressed, and

cools when trigger is released, was announced recently by Wen Products, Inc., 5806 Northwest Highway, Chicago 31, Ill.

The device also can be used for heating liquids, wood or leather burning and other art craft work. It has a built-in spotlight, and operates on 250 watts, 110-120 volt ac.

V V

Raytheon Announces New Telephone Battery Chargers

The Raytheon Mfg. Co. has announced new "high-rate" RectiChargeR models of 25, 50 and 100 amperes.

Telephone companies and manufacturers of telephone switchboard systems can now secure Raytheon RectiChargeRs of any capacity from 1 to 100 amperes. Larger capacities are also available in specially designed models if so desired, the company states.

The new Raytheon "high-rate" RectiChargeR models provide switchboard power stabilized to ±½ per cent regardless of line voltage or frequency variations. This is made possible in the "high-rate" models by a magnetic amplifier control circuit, according to the company.

The new RectiChargeR dispenses with expendable blowers, tubes and relays, assures smooth trouble-free operation and eliminates over-charging and under-charging, it is claimed.

Completely automatic in operation, the "high-rate" RectiChargeR handles all normal power requirements. The units have been specifically designed for use with switchboard systems for 22/24 cells of batteries and require a floor space of 16½ x 24 inches.

Complete technical details can be secured by writing to Raytheon Mfg. Co., Dept. 6470 TNR, Equipment Sales Division, Waltham 54, Mass.

V V

"One of the primary editorial policies of The Delavan *Enterprise* has been to create an interest in local government. This purpose is founded on the fundamental belief that a true and working democratic federal government is based on strong small units of democratic self-government such as are found in small cities and townships. We believe that strong democracies at the very core of our life will protect us from socialistic tendencies of government on higher levels." — Delavan (Wis.) *Enterprise*.

• • •

"My special plea is that all of us should work to further social and economic progress based on the common ethical principles of our religions and as expressed in the Constitution of our country. I am sure that this is the way to combat the false philosophies of communism and state planning and that only through a clear demonstration of the material and spiritual benefits of our free system can we convert others to it."—Charles E. Wilson.

• • •

" 'The legitimate object of government is to do for a community of people whatever they need to have done, but cannot do for themselves,' said Abraham Lincoln."—Fort Payne (Ala.) *Times-New Era*.

CONVENTION NOTICE

****We will be at the Pennsylvania Independent Telephone Association convention again this year. Come to our booth and discuss your Pole Line Construction Supply problems and let us tell you about the new Sterling Hydraulic Controlled Earth Boring Machine.****

****We will have on hand samples of items as follows: Lashing Machines, Lashing Wire, Lashing Wire Clamps, Aluminum Cable Blocks, Cross Arms, Locust Pins, Utility Cable Vises, Oak Brackets, Linemen's Leather Goods and Climbers, Ratchet Hoists, Collapsible Take Down Reels, Tackle Blocks, Polyethylene Tape, Load Binders, Glass Insulators and other Pole Line Hardware items. Stocks of the above items are available for immediate shipment from our warehouse in Forty Fort, Pennsylvania.****

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210 2-relay lines with one lamp and one multiple. 20 CSX lines with two lamp appearances. One one-half position. One cable turning section. Three dial circuits — one for each position. This board is in good condition and can be inspected at the Bear River Telephone Co., Tremonton, Utah.

Ill health forces sale of privately owned 200-station magneto exchange located in fast growing community 15 miles from large industrial area. Present rates good. Excellent business for man and wife. Write Box No. 3186, c/o TELEPHONY.

MAGNETO EXCHANGE—270 stations, grossing $9,500. One of the best small exchanges in North Missouri. Exceptional opportunity. $15,000 down —monthly payments on balance. Laclede Telephone Exchange, Laclede, Mo.

CUSTOM BUILT 30 TO 150 LINE MAGNETO SWITCHBOARDS, Rebuilt Equipment, New Cabinets, New Cables. McGrath Mfg. Co., Inc., 713 E. 8th St., Topeka, Kansas.

TELEPHONE EXCHANGE IN EASTERN SOUTH DAKOTA, located in county seat town, with prosperous surrounding farm area. Selling price less than two years gross. Write Box No. 3185, c/o TELEPHONY.

130-STATION MAGNETO EXCHANGE in Southern Minnesota. More stations can be added. Good toll business. Priced at $2500 without real estate. Inquire in person. Richard Walter, Hammond, Minn.

Tested used ringing machines, Sub-Cycle Model B.....$ 40.00
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3 bar—1000 ohm.....$6.50 each
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**W.E. #202, desk handset telephone, for use with separate bell box; can be used for magneto or C.B.....$10.00 each

**Federal Telephone, #802-A, latest type, self-contained desk phone equal W.E. #302.....$14.50 each dial blanked

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Western Electric, #202, desk handset phone, complete, excellent condition, with E-1 handset adapted with F-1 transmitter unit (for use with separate bell box) .....$10 each

Western Electric Magneto Ringer Box, excellent condition:
#315H—3 bar—1000 ohm at $6.50 each
#300K—5 bar—1600 ohm at $8.50 each
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CABLE SPLICERS, Station Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 6100 N. 20th, Philadelphia, Pa.

COMBINATIONMAN — permanent position, good wages, numerous employee benefits. Employment also affords opportunity for advancement. Replies are strictly confidential and should include details of experience and objectives. Write Union Telephone Co., Owosso, Mich.

LINEMEN AND APPRENTICES. Good pay. Permanent. Good future with new organization. Write for application blank and full details to Box 247, Station F, Buffalo 12, N. Y.

DISTRICT MANAGER FOR INDEPENDENT TELEPHONE COMPANY operating in Northern California. Position involves overall supervision of exchanges in several communities with both dial and magneto equipment of approximately 5,000 to 6,000 stations in the Shasta-Cascade outdoor Wonderland Area. Applicant must possess exceptional capabilities in leadership, general business ability, new business promotional accomplishment; also the ability to direct personnel in all phases of district telephone operation. Salary commensurate with qualifications. Replies confidential. Furnish complete details of education, experience and compensation requirement in first reply.

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MANAGER FOR RAPIDLY EXPANDING, EXTENSIVE GROUP OF WESTERN TELEPHONE PROPERTIES. Must have administrative ability simultaneously to obtain efficient operations and achieve required, sound expansion program. Must have capacity to hire, train and direct personnel in all phases of telephone work. Permanent position carrying substantial opportunity for qualified person. Technical, plant and commercial knowledge and experience absolute requirement. Salary commensurate with qualifications. Replies confidential. Furnish complete details of education, experience and objectives in first reply. Write Box No. 3170, c/o TELEPHONY.

A GOOD POSITION OPEN FOR THE RIGHT MAN—600 Common Battery. Trouble shooter will give wife or daughter a position. State age and salary desired. Apartment furnished. Callaham Telephone & Electric Co., Broken Bow, Okla.

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CABLE SPLICER, 28 years of age, seven years' experience. Desire something steady. Can call WA-3486. James Rominger, 2146 College Ave., Indianapolis, Ind.

COMBINATIONMAN in Northern State would like to transfer to southern half of Illinois or Missouri. Write Box No. 3187, c/o TELEPHONY.

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Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Inspectors stationed throughout U.S.A.

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Consulting, Engineering, Installation of Telephone Equipment, Cable Splicing, Aerial, Under-ground construction, Central Office Equipment a Specialty.

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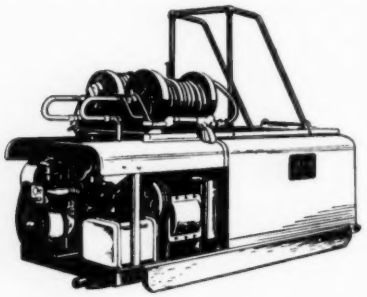

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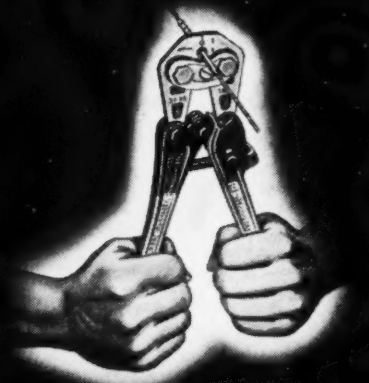

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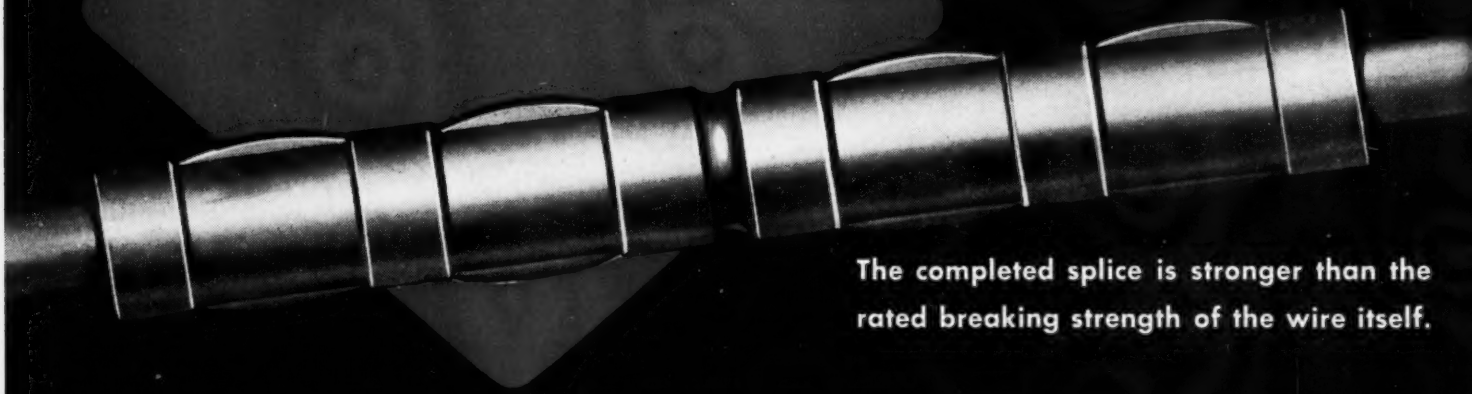

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